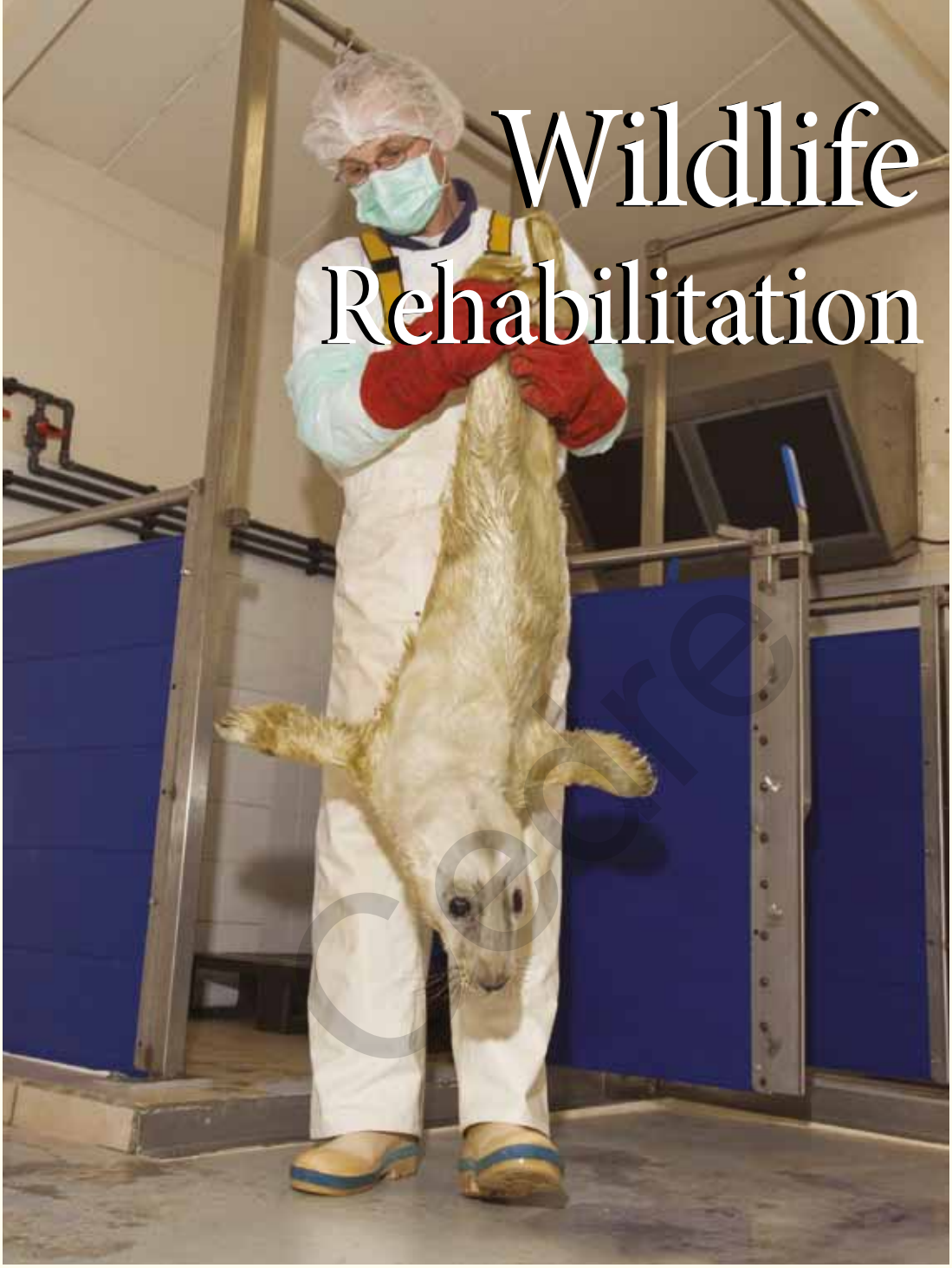

Wildlife Rehabilitation

OPERATIONAL GUIDE

Cedre

Wildlife Rehabilitation

OPERATIONAL GUIDE

Information
Decision-making
Response

Guide produced by Cedre with funding from Total SA and the French Ministry for the Ecological and Inclusive Transition.

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With the participation of: Alca Torda, La Rochelle Aquarium, Océanopolis' rehabilitation and conservation centre, CVFSE (*Centre Vétérinaire de la Faune Sauvage et des Écosystèmes des Pays de la Loire*), the French Water and Biodiversity Directorate under the Ministry for the Ecological and Inclusive Transition (DEB/MTES), the Saint-Pierre-et-Miquelon Directorate for Territories, Food and the Sea (DTAM 975), Brittany's Regional Directorate for the Environment, Planning and Housing (*DREAL Bretagne*), Hegalaldia and LPO (*Ligue pour la Protection des Oiseaux*).

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Cover photo:
Restraining a seal pup
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Purpose and structure of this guide

When an oil spill occurs, depending on the shoreline affected and the season, the impact on wildlife can be very high. Huge numbers of animals may require extremely urgent attention. During the latest spills which affected the French coastline, temporary wildlife response centres had to be set up in addition to existing facilities. Given the current capacity of the permanent centres, it is clear that temporary centres will again need to be set up in the event of a major spill.

Guidelines on setting up such centres were published by the *Observatoire des marées noires* in 2002, then a revised version in 2003. Since then, considerable experience has been acquired by different rehabilitation centres. Practices and protocols may vary however from one establishment to another. It therefore appeared to be worthwhile compiling a summary of this knowledge and harmonising it in a new operational guide.

It was decided that the scope of this guide would be extended: in addition to birdlife, it also covers the procedures applicable to marine mammals (pinnipeds and otters) and turtles.

It is generally not possible to save all oiled animals discovered alive. The question of triage upon arrival is therefore addressed, together with the criteria to determine whether rehabilitation or euthanasia is the most appropriate treatment. The first priorities are to ensure species conservation followed by minimising suffering, although emotional reactions from the public and societal demand should not be overlooked.

The first section of this guide addresses regulatory and organisational aspects. Although they are presented from a French perspective, the general notions developed in this document can be adapted to different national contexts.

The second section looks at some examples of past spills which provide relevant insight.

The third section is composed of practical datasheets applicable to a wide range of environments.

This guide is intended equally for planning and incident management personnel and for staff liable to work in such rehabilitation centres.

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Preparedness Response plan

A

General introduction

A1

This guide focuses on response to terrestrial and aquatic wildlife during a major crisis triggered by an oil or chemical spill.

The term "wildlife", as it is used here, encompasses undomesticated, non-captive, wild type, non-genetically modified faunal species.

Some of these species are liable to be contaminated during an oil or chemical spill.

This guide includes animals for which rehabilitation is possible based on the current state of knowledge, i.e. seabirds, marine mammals other than cetaceans (which often suffer little impact in the event of marine pollution), sea turtles and mustelids such as Eurasian otters or sea otters. Wildlife response comprises rehabilitation of rescued animals and the release of all specimens with a good probability of survival in the natural environment.

This document aims to provide guidelines for setting up temporary or permanent facilities as well as for reinforcing existing facilities in the event of large influxes of animals exceeding existing capacities for a particular area.

The purpose of such facilities is to take in and rehabilitate contaminated animals with a view to releasing them back into the natural environment. They are managed and run by qualified staff, which guarantees the best possible care for the animals in strict health and safety conditions. According to the country and to the scale of the incident, volunteers, interns or contract workers may be involved to provide back-up to the professional teams.

These centres contribute to species conservation and to the mitigation of the impact on the marine environment. Their role is not however to assess this impact, even although they can contribute to scientific studies by supplying research centres with certain data or even biological material (subject to the necessary authorisations being obtained).

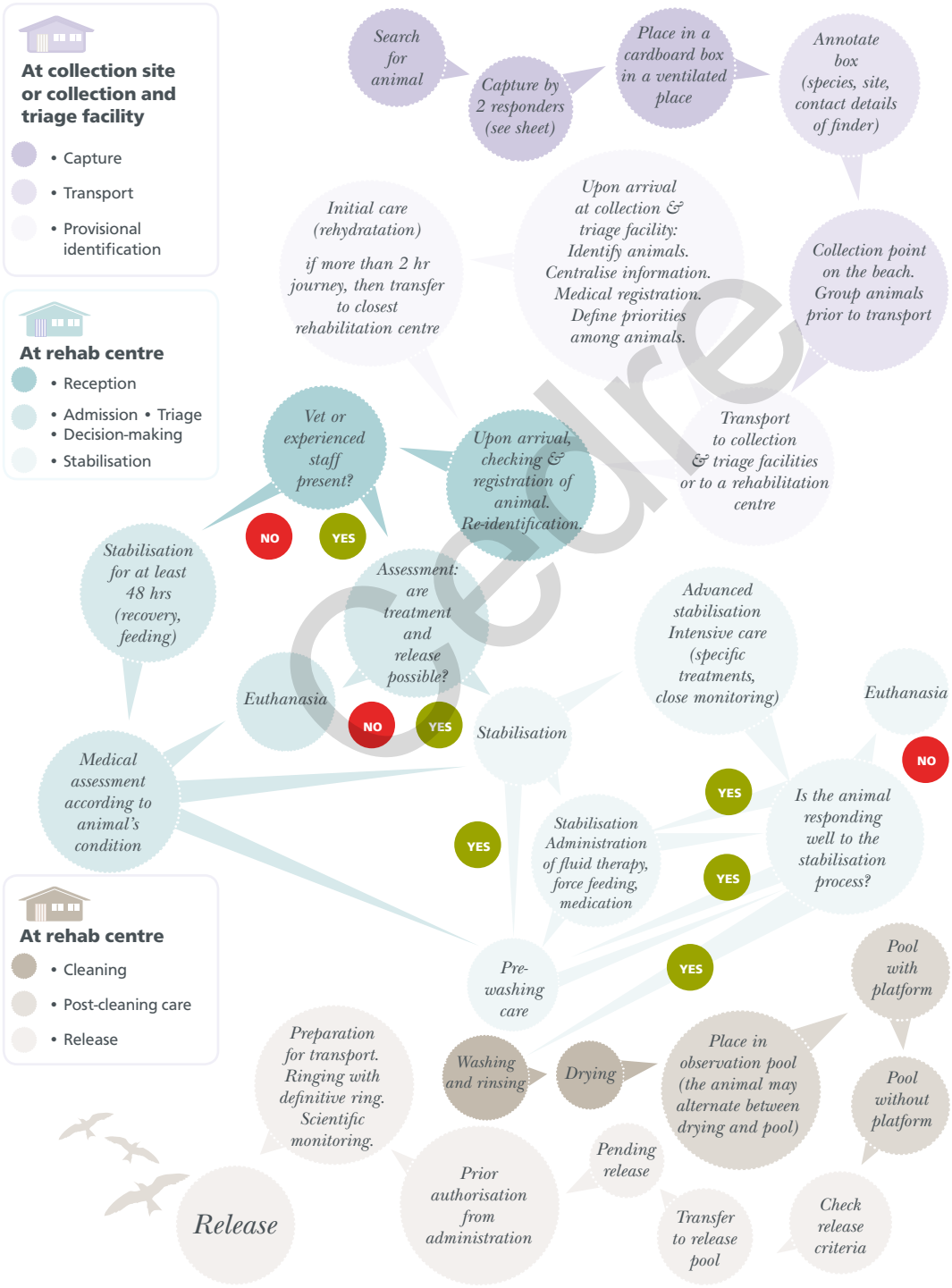
While the first part of this guide presents the relevant regulations in France, the good practices detailed in the technical datasheets are intended to be as international as possible.

Effects of oil on wildlife

Effects of oil on	Birds	Otters and seals	Turtles
Integumentary structures (fur, feathers and appendages)	• Loss of waterproofing of outer feathers and insulating down (drop in body temperature)	• Loss of coat waterproofing, reduction/destruction of insulating properties (drop in body temperature)	• Irritation and burning of the skin
Internal organs	• Irritation of mucous membranes • Conjunctivitis • Loss of sight • Impaired kidney function • Irritation of respiratory tract • Lesions to digestive tract • Deterioration of immune system	• Irritation of mucous membranes • Conjunctivitis • Loss of sight • Impaired kidney function • Breathing difficulties (following inhalation of vapours) • Stomach ulcers and bleeding (following ingestion of oil) • Diarrhoea • Deterioration of liver function • Weakening and destruction of immune system	• Irritation of mucous membranes around eyes, beak, digestive tract or lungs • Poisoning or blocking of digestive system • Accumulation of fermentation gases affecting buoyancy • Lesions to liver or lungs • Impairment of the immune system • Passing of certain components into eggs during gestation, influencing their development
Behaviour	• Changes in egg-laying and incubation patterns • Immersion or drowning: loss of buoyancy due to heavier feathers • Incapacity to flee predators. Slower and reduced flying ability	• Changes in reproductive behaviour • Lethargy and disorientation • Incapacity/difficulty in fleeing predators: oil sticks to body and fins • Increased risk of drowning • Interference with scents of pups and their mothers for identification: can lead to pup being rejected and abandoned	• Impaired reproductive capacities if the spill is near to a mating site • Deterioration of navigation and orientation capacities by individuals and groups • Changes in the geographical distribution of nesting beaches
Immediate environment	When eggs come into contact with oil: delayed growth of embryos and chicks, decreased hatching rate, chick malformation	• Food difficult to find: weight loss • Otters only (in particular pups): risk of intoxication if large quantities of molluscs or filter-feeders, which retain the oil, are ingested • Persistent pollutant residues in intertidal zones: risk of ingestion during grooming	• Nest contamination: impact on eggs; possible death or malformation of embryo • Change in nest temperature: influence on sex • Accumulation of oil in the turtles' food

A3

From capture to release



French regulations on managing and handling wildlife

In France, capturing, transporting and possessing non-domestic species of animals are regulated by law, to ensure appropriate welfare conditions. Certain species are classified as "protected" and their capture and possession are normally prohibited (article L.411 of the French Code of the Environment). However in certain situations, authorisation to hold non-domestic species in captivity can be issued. This is the case for rehabilitation centres, where the majority of species are classified as protected species. Certain species come under the authority of the Prefecture, while others come under ministerial authority, as concerns their transport for release.

Rehabilitation centres are thus specialised establishments whose role is to rehabilitate injured or ill animals found in the natural environment. They are authorised to temporarily take in protected species that individuals are prohibited from keeping in captivity in order to care for the rescued animals with a view to their reintegration back into the wild.

They must meet certain specific criteria and have been issued with the relevant **authorisation to open**, a **certificate of capacity** for the person in charge of animal well-being as well as **transport authorisation** for the relevant species. The certificate of capacity is only valid for a specific list of species and the centre is not authorised to keep other species (except with permission following a specific request to the authorities under exceptional circumstances, such as an oil spill).

The French order of 11/09/92 (amended by the ordinance of 21/09/00) sets out the conditions for the running of a rehabilitation centre and the captive living conditions of the animals. It sets out the primary objective of rehabilitation centres, the types of facilities they should have and the health and safety rules to be applied.

It is important to note that rehabilitation centres are not authorised to present the animals kept or open their facilities to the public.

The wildlife of overseas France makes up the largest population of marine animals, reflecting the predominance of these territories in French biodiversity (90 %). For the local authorities in overseas French territories where the French Code of the Environment applies, the regulatory framework is identical. Nevertheless, rehabilitation centres are not systematically present in these areas. A major oil spill could therefore affect very large populations of marine animals (birds, mammals, turtles), which would require emergency rehabilitation centres to be rapidly set up.

To obtain a wildlife rehabilitation certificate of capacity, the applicant must submit a request to the Prefect for his/her "département". This request will be processed by the Departmental Directorate for the Protection of the Population (DDPP). The applicant must specify the type of certificate sought and support his/her application with the relevant qualifications and experience, and submit an application which will be presented to a certification commission (article R.413-4 of the French Code of the Environment).

Authorisation to open a rehabilitation centre (autorisation d'ouverture d'établissement, AOE) must be requested at the same time as the certificate of capacity (article R.413-14 of the French Code of the Environment).

A5

Rehabilitation facilities in France

France has several wildlife rehabilitation centres specialised in marine species located along the coastline of mainland France as well as in certain parts of overseas France.

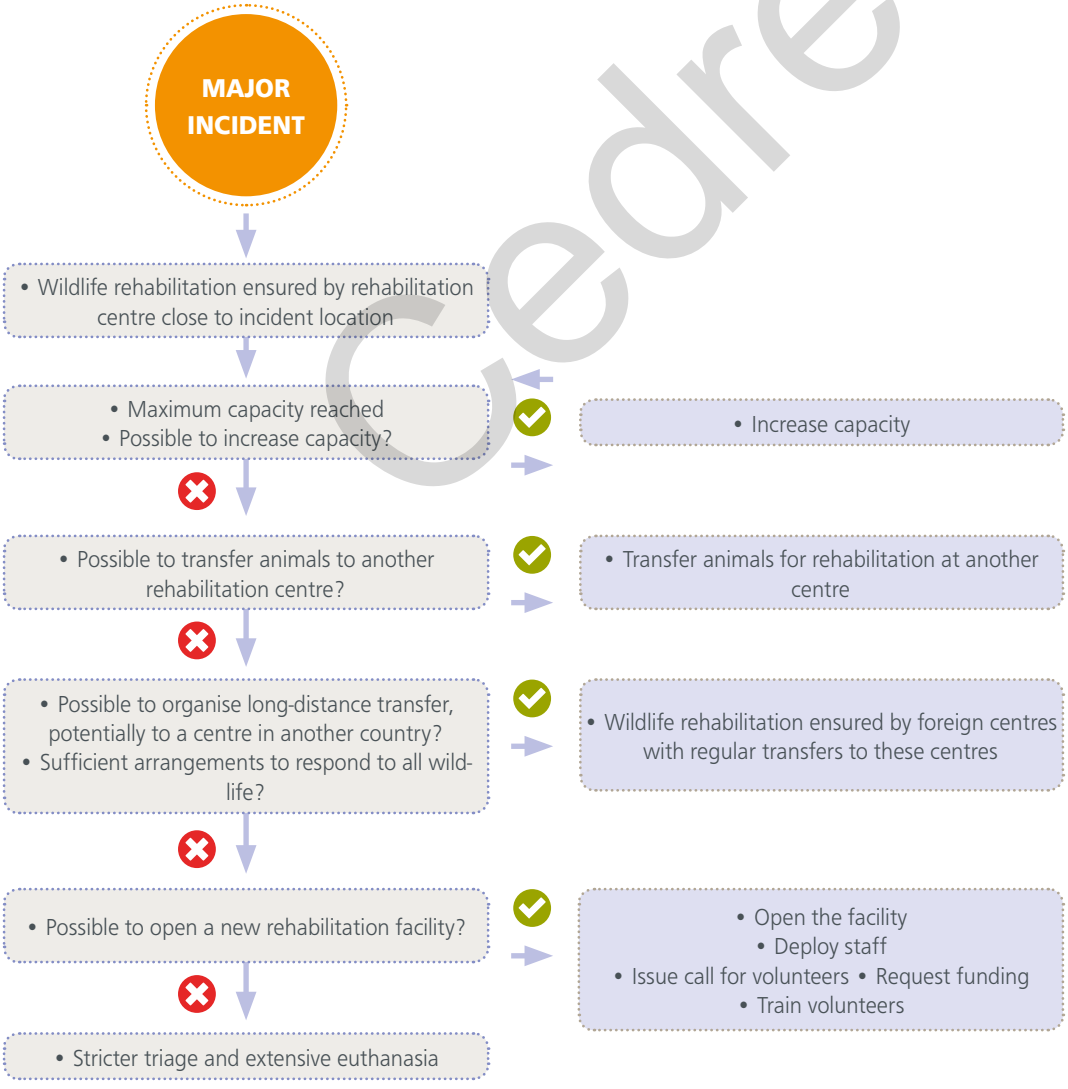
These centres operate all year round with specialised staff.

However, their capacity is limited, even although for some it can be increased in an emergency.

In addition to these centres, France has two mobile units which can be called out across mainland France to act as emergency mobile collection and triage facilities.

Experience has show that in the event of a major spill, the capacity of these facilities would be insufficient.

This gap must therefore be filled.

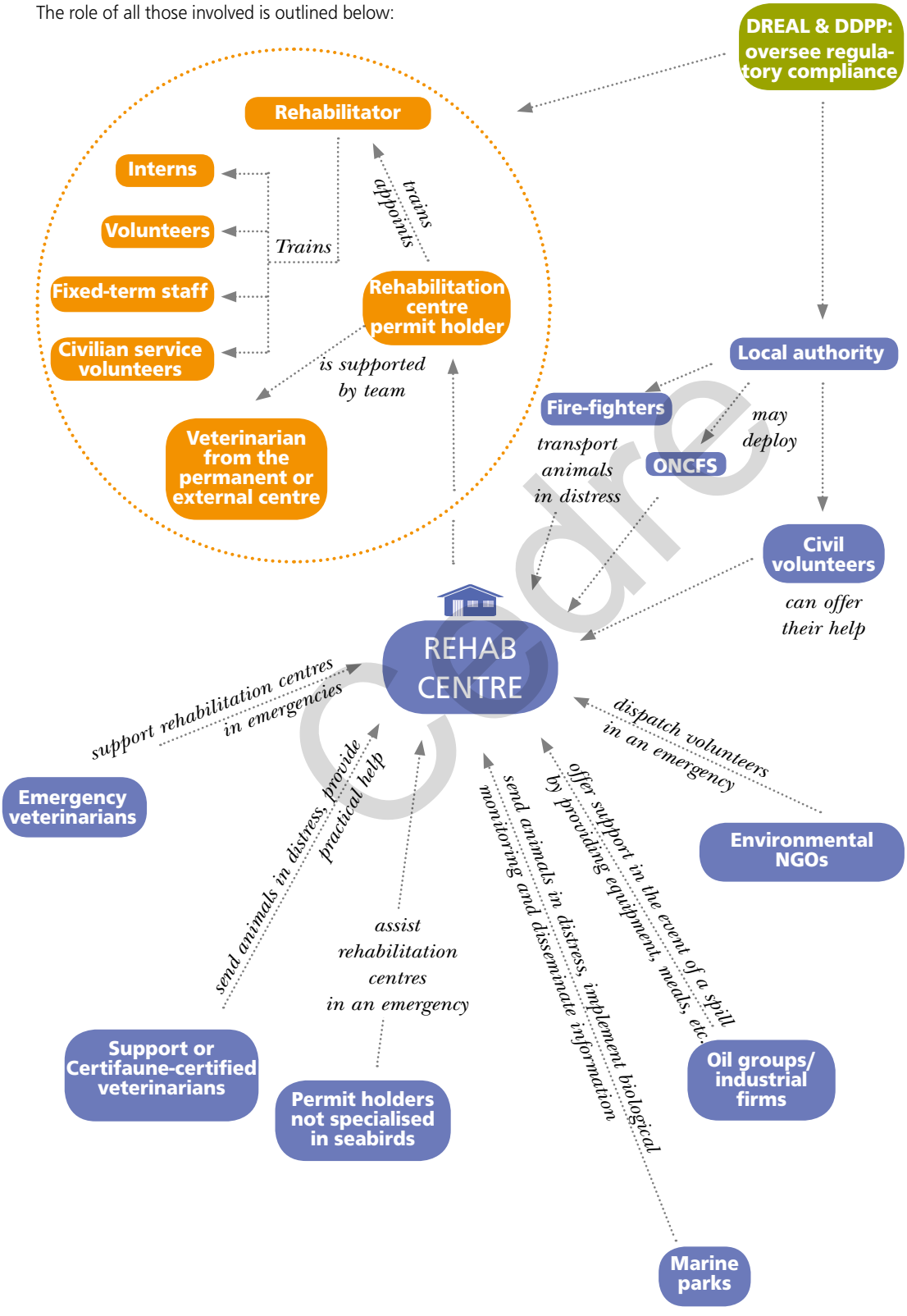


Stakeholders involved in rehabilitation centres

In mainland France, the following stakeholders are involved:

FROM CAPTURE TO RELEASE	STAKEHOLDERS
Capture	• Fire-fighters • ONCFS (National Hunting and Wildlife Agency) • Environmental NGOs • Marine parks • Volunteers
Transport	• Fire-fighters • ONCFS • Volunteers with authorisation from DREAL • Environmental NGOs with authorisation from DREAL • Marine parks with authorisation from DREAL • Companies with authorisation
Admission	• Rehabilitation centre permit holders or volunteers • Rehabilitation centre veterinarians or volunteers • Rehabilitation centre staff or volunteers • ONCFS • Volunteers
Triage	• Rehabilitation centre permit holders • Animal welfare managers from other rehabilitation centres • Rehabilitation centre veterinarians or volunteers
Treatment	• Rehabilitation centre veterinarians or volunteers • Rehabilitation centre permit holders • Permit holders from other rehabilitation centres providing support • Rehabilitation centre staff or volunteers • Volunteers for minor care duties (feeding, rehydration) • Rehabilitation centre interns for minor care duties • Rehabilitation centre civilian service volunteers for minor care duties
Washing	• Veterinarians • Permit holders (rehabilitation centre + other centres) • Rehabilitators • Volunteers (with supervision)
Recovery	• Veterinarians • Permit holders (rehabilitation centre + other centres) • Rehabilitation staff • Volunteers (with supervision)
Release	• ONCFS • Veterinarians • Permit holders (rehabilitation centre + other centres) • Rehabilitators • Environmental NGOs • Marine parks • Interns • Civilian service volunteers • Volunteers (with transport and release authorisation from DREAL)
Scientific monitoring	• Veterinarians • Researchers • Marine parks • Environmental NGOs
Coverage of costs	• Environment ministry • Oil industry firms • Polluter's insurers

The role of all those involved is outlined below:



The French emergency management framework

Contingency provisions

France has a civil protection response organisation known as ORSEC (*organisation de la réponse de sécurité civile*) to handle emergency situations. This organisation is implemented at commune, department, zone and maritime levels. Marine oil pollution (whether accidental or deliberate) comes under ORSEC's specific 'POLMAR' (maritime pollution) provision.

Response often begins at sea at the incident location; in this case the POLMAR provision under the maritime ORSEC emergency response organisation is implemented under the authority of the Maritime Prefect. If the pollution spreads as far as the coastline, the POLMAR provision of the departmental ORSEC emergency response organisation is generally activated, under the authority of the Departmental Prefect.

Under the French crisis organisation ORSEC, the mayor (the local authority) plays the role of Director of Emergency Operations:

- whenever a major event occurs in their municipality;
- in as far as they have sufficient response resources;
- as long as the incident does not spread beyond the boundaries of the municipality.

In reality, the mayor is the Director of Emergency Operations as long as the Prefect does not take over responsibility. The Prefect takes charge of operations if:

- the municipality's own response capacities are insufficient;
- imposed by the scale of the pollution, the degree of danger, the sensitivity and length of shoreline affected, the quantity of pollutant spilt, the consequences of the incident or any other parameter requiring the intervention of the State representative;
- the local authority fails to take the necessary action, even after receiving formal notice.

Who pays?

The response costs may be covered or reimbursed by various sources:

- either directly by the polluter, if identified and if a direct causal link has been established between the incident and each instance of damage. The polluter may directly cover the cost of operations or subsequently reimburse expenses;
- or through the International Oil Pollution Compensation Funds (IOPC Funds), if the pollution is due to a spill of persistent oil from an oil tanker. The IOPC Funds do not pay out the funds required for operations in advance, but can reimburse certain expenses.

In both cases, each decision made must be justified and all operations must be documented (photographs, meeting minutes, invoices, etc.). All expenses incurred will not systematically be reimbursed.

In some cases, the polluter cannot be identified. To overcome this obstacle, the French State established the POLMAR intervention fund, to which the local authority can submit a claim, through the Prefect, for the reimbursement of exceptional expenses. The activation of this fund is subject to conditions.

What happens if wildlife is affected?

In France, the POLMAR crisis procedure for wildlife response comprises different stages:

1) Network activation (pre-alert and alert phase)

The rehabilitation centres are informed by the authorities of the implementation of specific POLMAR provisions.

Once the pollutant has been identified, the authorities issue the safety instructions to be given to personnel handling animals.

However, birds sometimes arrive on beaches before the slicks and therefore potentially before the POLMAR provision has been activated. In this case, the Prefecture's monitoring unit is responsible for alerting and formalising the mobilisation of rehabilitation centres and environmental NGOs. Such organisations may be involved in shoreline surveys and wildlife collection.

2) Plan activation

Wildlife collection (of both live and dead animals) is initially organised by the local authorities in collaboration with the DDPP (Departmental Directorate for the Protection of the Population), DREAL (Regional Directorate for the Environment, Planning and Housing) and ONCFS (National Hunting and Wildlife Agency), or their equivalents in overseas France, pending the establishment of a reinforced, structured network. DREAL is responsible for defining the bird collection, triage and transport plan.

3) Crisis management

- **Animal triage and transport:** carcasses should be placed in a plastic bag and stored separately from other waste, while live animals should be placed in an appropriate container. They are then taken to a forward holding centre or rehabilitation centre.

> **Warning**: marine mammals must only be transported by trained and qualified personnel.

- **Rehabilitation:** mobilisation of permanent rehabilitation centres as well as mobile units and set-up of temporary facilities.
- **Wildlife release:** the conditions for the release of rehabilitated animals are validated by the Prefect.
- **Waste management:** the different sorts of waste produced are channelled to the appropriate facilities (for more details, see datasheets C39 and C40) following approval from DREAL.
- **Network supervision:** a specific unit led by the DDPP (Departmental Directorate for the Protection of the Population) liaises between the wildlife rescue network and the other stakeholders. Rehabilitation centre managers draw up a daily summary and report any resources they may require.

4) End of the emergency

Temporary facilities are shut down and returned to their original use.

Response outside of the French emergency framework

The specific POLMAR provision is not systematically implemented; its necessity is determined on a case by case basis.

If it is not implemented because the Prefect deems that the situation does not require him/her to take over as Director of Emergency Operations, the mayor retains this role. If the municipality has its own contingency plan (*Plan communal de sauvegarde*), it may be activated.

The mayor draws upon the municipality's resources and can request additional resources from the fire service (*Service Départemental d'Incendie et de Secours*, SDIS). If several municipalities are affected, the relevant federation of municipalities can take charge of certain aspects, such as waste management.

The local authority may seek advice from decentralised State services and expert organisations. It may also request equipment from a POLMAR stockpile, although this will be invoiced.

If the specific ORSEC/POLMAR provision is not implemented, the POLMAR fund may exceptionally be activated, in which case the rehabilitation centres may benefit from their funding if the centre has been officially mobilised and if the expenses are eligible. The (cumulative) conditions for the activation of this fund are as follows:

- the need to deploy resources exceeding the current response capacity of the State services;
- the exceptional nature of the expenses incurred;
- a response request issued by the Maritime Prefect or Departmental Prefect.

If these conditions are not fulfilled, the rehabilitation centres will need to seek reimbursement for all or part of their expenses from the polluter (if identified) or seek additional funding from the State or a local authority. It is recommended that the question of funding be addressed prior to beginning rehabilitation operations or even before setting up a temporary structure.

This issue can also arise in other circumstances potentially generating a large number of animals in distress (for instance during storms).

How to proceed without a pre-existing plan

A9

Not all countries or regions have a specific oiled wildlife response plan.

In this case, before launching operations, it is important to look into legislation relating to:

- the status of the different species involved or potentially involved,
- the collection, transport and possession of wild species,
- the national/local policy in terms of species conservation (including criteria for opting for rehabilitation or euthanasia),
- methods of euthanasia for different species,
- conditions for release,
- the treatment of wastewater, as well as animal waste (including oiled waste) and medical waste,
- the health and hygiene of operators exposed to wildlife and oil (or whatever the pollutant involved),
- the conservation of animal carcasses for scientific purposes,
- environmental monitoring following a major spill,
- the funding of these various actions and reimbursement procedures.

According to the circumstances, the ministries and authorities involved will differ, but may include:

- the ministry of the environment/wildlife/waste management,
- civil protection,
- the ministry of the sea/fisheries/merchant shipping,
- veterinary services,
- the ministry of health,
- the ministry of work/labour,
- the ministry of transport,
- the ministry of scientific research,
- the ministry of finance.

It is also advisable to contact:

- any existing rehabilitation centres,
- environmental protection NGOs,
- marine/nature parks,
- zoos.

International assistance

Various organisations can provide technical or organisational support for operations.

The main two such organisations are:

Sea Alarm
www.sea-alarm.org

The primary vocation of this Brussels-based foundation is to provide assistance in wildlife response planning through:

- meetings and projects involving the authorities, industry and NGOs,
- training and exercises,
- contingency planning assistance services,
- research projects.

Its staff can be mobilised in an emergency to help organise the response effort and to provide advice on the overall strategy to be adopted.

International Fund for Animal Welfare (IFAW)
www.ifaw.org

This US-based international fund has offices in many countries, including France. In an emergency, it can send technical advisers and veterinarians on site to provide advice on setting up rehabilitation centres and on rescue and rehabilitation techniques.

Health and safety

A11

A key concern

The health and safety of operators involved in wildlife rescue operations must be a key concern. If health and safety rules are not established and obeyed, no operations should be conducted.

The main risks to which responders are exposed during such incidents are related to contact with oil. This can lead to skin irritation, eye irritation or even autonomic disorders which can be prevented by abiding by certain safety rules. Particular attention must also be paid to contact with animals and, once again, the risks can be mitigated by following certain animal handling guidelines (see datasheets C8, C9 and C10).

Appropriate protection

Responders must be informed of these risks and be trained in the use of personal protective equipment (PPE) and in the tasks they will be carrying out. Inexperienced responders should be supervised and never left to work alone. During field work or animal collection operations, responders should work at least in pairs.

The PPE worn should be suited to the weather conditions, the type of pollutants, the type of animal being rescued as well as the risks incurred. The highest possible level of protection should be used while keeping discomfort and hindrance to a minimum. Pregnant women and minors should not take part in rescue operations.

Registration and insurance

All individuals involved in wildlife rescue operations must be registered. The basic information to be recorded includes the individual's full contact details, date of arrival and departure from the site, membership of an association where applicable, vaccination history, as well as any allergies or health conditions (see Appendix D3). In the same way, every day, the activities and tasks carried out by each person should be recorded for monitoring purposes.

In France, if an incident occurs involving an individual who is not an employee of the rehabilitation centre, the "voluntary assistance agreement" defines the legal rules. It is also preferable to take out a third party liability insurance policy. Each volunteer should also be asked to present a civil liability insurance certificate proving that they are covered in case they cause an accident. The victim may make a claim against the organisation or against the person having caused the accident.

Planning and training

Backtracking

The creation of an emergency rehabilitation centre should be planned well before an incident occurs. Solid cooperation between State services, local authorities, rehabilitation centres and their volunteer networks is crucial to ensure successful operations. Once the specific POLMAR wildlife provision has been implemented, the different stages of wildlife response and of the establishment of one or more emergency centres must take place in quick succession to optimise the animals' chances of survival. Nevertheless, volunteer safety must not be overlooked and optimal conditions should be provided to ensure quality care.

Planning, a must

Oil spills are rare yet unpredictable occurrences. It is therefore crucial to have a pre-defined action plan to keep the inevitable disarray triggered by such events to a minimum. National contingency plans are valuable tools which should be tested through exercises and regularly updated. Wildlife response should not be neglected on the pretext that it is less important.

A network of trained responders

It is strongly recommended that a network of professionals (veterinarians, rehabilitators, etc.) and volunteers who can be mobilised in an emergency be organised and trained. By identifying these people and keeping a regularly updated database, it will be quicker and easier to contact them in the event of an incident. Regularly run training courses and exercises will ensure that responders are prepared for an emergency. Trained responders can thus be called upon to supervise wildlife rescue operations.

Feedback from past incidents

Figures for a few spills

Name of spill / Parameters	*Amoco Cadiz*	*Braer*	*Sea Empress*	*Erika*
Date of spill	• 16/03/1978	• 05/01/1993	• 15/02/1996	• 12/12/1999
Spill location	• France (Brittany)	• United Kingdom (Scotland)	• United Kingdom (Wales)	• France (Brittany)
Type of pollutant	• Crude oil	• Crude oil	• Light crude oil	• Heavy fuel oil (n°6)
Volume spilt in tonnes	• 220,000	• 84,500	• 73,000	• Between 19,000 and 20,000
Ship type	• Oil tanker	• Oil tanker	• Oil tanker	• Oil tanker
Context	• Grounding	• Grounding (storm)	• Grounding	• Hull fracture (storm)
Number of animals found (alive + dead)	• 4,043 (taken to rehab centre) • Unknown number of live animals • 3,901 dead	• 1,811 • 266 alive • 1,545 dead	• Around 7,000 • 3,428 alive • 3,495 dead	• 63,606 • 36,157 alive • 27,449 dead
Total hypothetical number of affected animals	• 19,000 to 37,000	• 5,000	-	-
N° of animals released	• 294	• 31 (seals)	• Around 2,100	• 2,119
Type of animals affected	• Common guillemot • Razorbill • Atlantic puffin • Cormorant	• Common shag • Black guillemot • Common eider • Long-tailed duck • Great northern diver • Black-legged kittiwake • Common seal • Grey seal	• Surf scoter • Common guillemot • Razorbill • Red-throated diver • Grey seal	• Common guillemot • Northern gannet • Common scoter • Common eider • Razorbill
Most affected species	• Razorbill	• Common shag	• Surf scoter	• Common guillemot

Treasure	Jessica	Prestige	Tricolor	Rena
• 23/06/2000	• 16/01/2001	• 13/11/2002	• 14/12/2002	• 05/10/2011
• South Africa	• Ecuador	• Spain (Galicia)	• France • Belgium • Netherlands	• New Zealand
• Bunker fuel	• Diesel oil + Intermediate fuel oil (IFO 120)	• Heavy fuel oil n°6 (M100)	• Heavy fuel oil (IFO 380)	• Heavy fuel oil (IFO 350) + containers
• 1,000	• 600	• 64,000	• 170	• 350
• Bulk carrier	• Oil tanker	• Oil tanker	• Car carrier	• Container ship
• Damage and sinking	• Grounding	• Hull fracture	• Collision	• Grounding
• 40,000 • 38,000 alive (of which 20,000 relocated) • 2,000 dead	• 370 • 364 alive • 6 dead	• 23,181 • 6,120 alive • 17,061 dead	• Approx. 14,500 • 8,295 alive • 6,011 dead	• 2,500 • 409 alive • 2,091 dead
-	-	• 115,000 to 230,000	-	• 20,000
• 18,000	• 364	• 629	• 576	• Around 400
• African penguin • Pelican • Various seabirds	• Marine iguana • Pelican • Sea lion • Sea turtle • Blue-footed booby • Nazca booby	• Common guillemot • Puffin • Northern gannet • Razorbill • Turtle • Cetaceans	• Common guillemot • Razorbill • Great crested grebe • Red-throated diver • Gulls (herring gull and great black-backed gull)	• Little penguin • New Zealand dotterel • Fur seals
• African penguin	• Marine iguana	• Common guillemot	• Common guillemot	• Little penguin

N.B.: Given the large number of bibliographical sources and hence the great variety in the data presented, certain figures may differ slightly from those found in other publications.

Amoco Cadiz spill

Background

On 16th March 1978, the *Amoco Cadiz* ran aground less than 2 km from the Breton coast off Portsall (France), with 224,000 tonnes of oil onboard (220,000 tonnes of crude oil and 4,000 tonnes of bunker fuel). The entire cargo gradually leaked out as the ship began to split, polluting 360 km of shoreline between Brest and Saint-Brieuc.

Response organisation and deployment

On the morning of 17th March, members of the SEPNB (Society for the study and protection of nature in Brittany, today Bretagne Vivante) trawled the shores near to the spill site to gauge the extent of impact on local wildlife. The first live and dead birds were soon discovered, followed by many more. The SEPNB thus decided to open a rehabilitation centre in Portsall on 18th March. On 20th March, the French environment ministry organised a meeting at the Sub-Prefecture in Brest to determine the role of the different response players. Two associations –LFPO (French bird protection league, now LPO) and SEPNB– were tasked with oiled wildlife collection and response. Some 30 rescue centres were opened in the affected area.

Facts & figures

- 4,043 birds collected between 17th March and the month of May;
- Many birds never found;
- Discovery rate estimated at 22% according to a carcass drift study;
- Between 19,000 and 37,000 birds actually affected.

Oiled cormorant

Conclusion

Positive aspects:

- quick set-up of rehabilitation centres;
- heavy involvement of NGOs and voluteers.

Negative aspects:

- cooperation problems between different NGOs;
- disagreement on rehabilitation techniques;
- disagreement on general communication about the crisis;
- tension between rehabilitation centres;
- non-disclosure of animal admissions by certain rehabilitation centres;
- problems with the standardisation of animal counting systems;
- refusal by beach cleaners to collaborate with wildlife NGOs.

This incident raised different questions with respect to future incidents:

- How can a universally accepted counting system be established?
- How can we ensure beach cleaning teams cooperate with nature protection NGOs?
- How can rehabilitation protocols be standardised?
- How can a consensus be found on communication with the general public?
- How can a readily activated network of NGOs and volunteers be set up?

Erika spill

Background

On 11th December 1999, the oil tanker *Erika* was caught in severe weather conditions when the master issued a mayday, before subsequently cancelling it. On 12th December, the master sent out a new distress alert and asked for his crew to be evacuated from the ship which, he reported, was breaking in two. This is what ultimately happened two hours later, causing 7,000 to 10,000 tonnes of n°6 heavy fuel oil to leak out. The bow section of the vessel sank during the night and the stern section, held by a tug, sank the following day. Meanwhile the first oil slicks were observed at sea. They began to wash up on the shores of southern Finistère on 23rd December. Oil continued to reach the shores until 31st December. The total quantity spilt was estimated between 19,000 and 20,000 tonnes.

Response organisation and deployment

The French maritime pollution response (POLMAR) plan was activated on 12th December by the Maritime Prefect for the Atlantic. The shoreline response plans of the different areas affected were activated between 22nd and 24th December. The first oiled bird was found on a beach in the Morbihan area on 14th December. Bird collection and response was very rapidly organised and seven official collection and triage centres were set up from 15th December. Ten new rehabilitation centres, in addition to the 3 pre-existing centres, opened as of 19th December. It took around a fortnight for these centres to achieve optimal functioning.

Facts & figures

- Overwintering of birds in Northern Europe in the Bay of Biscay at this time of year;
- 400 km of coastline oiled;
- approximately 64,000 oiled birds found;
- 36,000 live birds found;
- 5,460 birds transferred to rehabilitation centres abroad (Belgium, Netherlands and England);
- 2,000 new strandings a few months later following oil upwellings and beached oil being washed back out to sea;
- 2,119 animals released.

Oiled bird

Oiled common scoter

Conclusion

Positive aspects:

- Widespread mobilisation of volunteers and NGOs;
- Post-spill drafting of methodological guidelines on oiled wildlife response.

Negative aspects:

- Problems in rapidly mobilising the resources required;
- Problems in standardising tracking documents and registers listing the animals recovered on beaches.

Following this incident, different questions were raised with respect to future incidents:

- the need to add a "wildlife" annex to the POLMAR contingency plans;
- the need to develop a reference document listing the equipment required to respond to such an incident;
- the need to establish a standard register (for incoming and outgoing animals, record sheets);
- the benefits of a fully computerised management system;
- the creation of a regularly updated standard rehabilitation protocol.

Treasure spill

B4

Background

On 14th June 2000, the ore carrier *Treasure* was caught in a storm and suffered damage off Cape Town (South Africa). The ship requested to return to port but access was denied. The *Treasure* anchored a short distance away, pending the arrival of maritime safety inspectors to inspect the vessel. On 21st June, the vessel was ordered to unload the contents of its bunker tanks but the shipowner did not take action. The authorities therefore towed the ship out to sea and, on 23rd June, the *Treasure* sank between Robben Island and Dassen Island, spilling 1,000 tonnes of heavy fuel oil.

Response organisation and deployment

The same day, vast resources were deployed to clean up the shoreline. Robben Island and Dassen Island are home to the two largest colonies of African penguins. Nesting season was in full swing. Given these circumstances, an unprecedented rescue operation was conducted: 20,000 penguins were captured and evacuated, then released 800 km away to give volunteers time to clean up the shores. Three penguins were tagged to track their journey and estimate when they would arrive back. In addition to this, 20,000 oiled penguins were taken to the seabird rehabilitation centre run by the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB), with support from IFAW.

Facts & figures

- 45,000 volunteers and 130 international supervisors;
- 18,000 animals released;
- 90 % rehabilitation rate;
- 2,000 animals dead or euthanised;
- €300 spent for each African penguin;
- A penguin population 19% larger than an untreated population;
- Thousands of people followed the journey of the tagged penguins online.

Conclusion

Positive aspects:

- Immediate deployment of rescue teams;
- Use of proven rehabilitation protocols;
- Experienced teams;
- The African penguin is an easy species to rehabilitate (hence the high release rates);
- High level of donations and funding.

This incident is cited as one of the largest and most successful wildlife rescue operations. **No significant negative aspects** have been reported.

Tricolor spill

Background

On 14th December 2002 at around 2:30 am, the car carrier *Tricolor* rammed into the container ship *Kariba*, some 20 nautical miles from the French coastline, off Dunkirk. The *Tricolor* sank within minutes. This incident occurred just a month after the sinking of the *Prestige* near seabird overwintering grounds where specialised associations and rehabilitation centres were already mobilised. On 15th January 2003, pollution was observed at sea and on the French beaches. On 23rd January, this pollution spread further following an incident during pumping operations. In total, some 170 tonnes of IFO 380, a highly viscous fuel oil, were released at sea.

Response organisation and deployment

On 25th January, it was decided that an emergency rehabilitation centre would be opened in Ostend (Belgium). This centre received 536 live birds on its first day. On 26th January, the wildlife response organisation began to take shape. Beach surveys were launched and the network became established. 850 new birds arrived at the temporary centre. Its maximum capacity was reached and animals had to be dispatched to other centres in Belgium and the Netherlands. A few animals were transferred to the United Kingdom. On the French side, LPO and the centres in the north of France took in some of the stranded birds.

Facts & figures

- 9,000 birds found, including both live and dead birds (Belgium, Netherlands and Great Britain);
- 576 released for these 3 countries combined;
- 5,500 birds found, live and dead, in France.

Registering a bird

An oiled guillemot

Conclusion

(Based on a report by Sea Alarm on Belgian centres)

Positive aspects:

- large number of volunteers;
- quick selection of rehabilitation centres to be involved;
- good international cooperation;
- good cooperation with Belgian authorities;
- good organisation for animal collection;
- good logistics;
- quick arrival of birds, hence in relatively good form.

Negative aspects:

- slow to report incident to NGOs (24 hours after incident);
- problems in command structure;
- several changes of wildlife response coordinator;
- lack of experienced personnel for bird washing;
- logistical issues at the Ostend rehabilitation centre.

This incident raised different questions with respect to future incidents:

- Must all animals be taken in?
- Should triage criteria be reviewed?
- How can a reliable network be set up?
- Should a contingency plan be drafted?
- How can experienced staff be mobilised and how can foreign rehabilitation centres that can be called upon be identified?

Lessons learnt from these four major spills

These four incidents took place under different circumstances and at different times, yet they all had an impact on the organisation of wildlife response.

General organisation

Wildlife rehabilitation stakeholders were generally alerted rapidly, allowing the response set-up to be established in a relatively efficient manner. The deployment of volunteers and specialised professionals was relatively efficient and sufficient at the onset of the crisis, but tended to wane later. The organisation of wildlife collection was successful and led to the rapid dispatch of animals to the appropriate centre. The set-up of improvised rehabilitation centres took longer and was difficult, but they were generally operational and optimised within a fortnight.

A variety of circumstances

Every incident is unique. The time of year, geographical location, distance to the coast, and the type and quantity of pollutant all affect the consequences for wildlife. If a spill occurs in bird overwintering grounds or nesting grounds, in particular if it affects a large number of reproducers, the environmental cost will be high. If it occurs close to the shoreline, birds will wash up earlier and will be in better physical condition, although in this case rehabilitation centres will have less time to get organised. Every situation therefore has its difficulties. The preparation of rescue plans and the identification of resource organisations and people help to overcome these difficulties.

Post-spill progress

In the wake of every incident, wildlife rescue, admission and rehabilitation processes evolve. Protocols have been revised with each new incident and have sometimes been a source of conflict between rehabilitation centres during emergencies. Similarly, tension and disagreements have appeared due to inadequate coordination. The establishment of a technical component specific to wildlife in the POLMAR provisions, introduced in the aftermath of the *Erika* spill, means that every coastal area (*département*) in France knows how to react efficiently when an oil spill occurs and has access to a list of key contacts.

What remains to be done in France

- Improve the inventory system for dead and live animals;
- Create a standard, computerised register of incoming and outgoing animals as well as a standard rehabilitation record sheet and a management software programme;
- Establish a standard, universally accepted, regularly updated and widely distributed rehabilitation protocol;
- Establish unified animal selection and triage criteria;
- Secure sustainable funding for permanent rehabilitation centres:
- Set up a network of trained and experienced responders and organise regular exercises.

Examples of managing other incidents

Polyisobutylene spill

In 2013, near 4,000 birds washed ashore in the United Kingdom in the aftermath of a spill of a hydrophobic compound which is extremely sticky when in contact with water: polyisobutylene (PIB). Used in the manufacture of chewing gum, sealants and tyres, it was legal to discharge this substance at sea, subject to certain conditions, during tank cleaning operations. Polyisobutylene breaks down very slowly and can float at the surface for long periods of time. Pelagic birds come into contact with slicks when floating or diving for food. They become coated with the chemical and are unable to fly; they are at risk of drowning or washing ashore.

The Royal Society for the Protection of Birds (RSPB), the Royal Society for the Prevention of Cruelty to Animals (RSPCA) as well as the Marine Conservation Society and Wildlife Trusts joined forces to request that the International Maritime Organization (IMO) review the legal status of the discharge of this product at sea. This request culminated in a worldwide ban on PIB discharge and the reclassification, effective from 2014, of these substances under Annex II of the MARPOL Convention.

Winter storms

Between late 2013 and April 2014, more than 50,000 birds washed ashore along the European coastline (with over 42,500 in France). This winter was particularly marked by a succession of disturbances in the Bay of Biscay coming from the Atlantic. Birds overwintering in this area (mostly auks and more specifically puffins) grew weaker at sea, were unable to find food and drifted to the shore.

Such occurrences are relatively rare, the previous such mass strandings having occurred in 1983 on the coasts of Great Britain, when more than 34,000 birds were counted. Very few birds reached the shore alive and could be recovered by rehabilitation centres. Only 1,565 animals were taken to 5 centres, with a survival rate of 13.4 %.

A bird contaminated with PIB and debris

Storing puffin carcasses

Examples of post-spill monitoring

In the United States

Following the *Stuyvesant* spill on 6th September 1999, which affected California, a monitoring programme was implemented. In total, 644 birds were rehabilitated using the Oiled Wildlife Care Network (OWCN) protocol. A study was conducted on 56 common guillemots (31 oiled and rehabilitated and 25 unoiled "control" birds). The birds were fitted with radio transmitters (with a mortality detector), released in Humboldt Bay around 2 km from the spill location and were followed by plane. The aim was to compare the survival rate of the rehabilitated birds with a group of control birds to understand the long term impact of oil.

By comparing the results obtained with those of previous studies, it was shown that oil can have an impact on certain vital organs, leading to the premature death of the animals if not rehabilitated. Following rehabilitation, the birds moved around, interacted and fed in the same way as the control birds. Thanks to revised rehabilitation protocols, animals have a longer life expectancy and are quicker to recover their natural behaviour than a few years ago.

In New Zealand

On 5th October 2011, the *Rena* ran aground off New Zealand before sinking in January 2012. Nearly 400 live seabirds were found. A study was conducted on a population of 708 little penguins (347 rehabilitated and 361 control birds), which were tagged with passive integrated transponders to allow monitoring for up to 23 months post-release.

They were released at three nesting sites. Monitoring showed that this species responds well to rehabilitation. The survival rate of the "control" population was the same as that of the "rehabilitated" group. Nest searches were conducted from mid-August 2012 to the end of the breeding season. The parameters studied gave similar results for the two populations, with the exception of hatching success, which was slightly lower for the rehabilitated birds.

The study reveals the importance of implementing a rapid response: when animals are admitted promptly to a rehabilitation centre they are less exposed to oil and its effects. It also highlighted the difficulty in conducting this type of experiment due to variety of popultions: "rehabilitated" pairs, "control" pairs or "combined" pairs with one rehabilitated penguin. Data interpretation could therefore be skewed for certain analyses.

An oiled common guillemot

Releasing little penguins after rehabilitation

Response – practical datasheets

Personnel organisation and management

Daily organisation

Certain procedures are essential to ensure that the facility is run smoothly.

As soon as volunteers arrive, they should be registered, given a badge and be assigned to a particular team.

Every morning, the facility manager should meet with the team leaders, who then pass on the instructions to the staff. It is important to:

- run through the work already accomplished, the situation and how it is evolving;
- recap health, safety and communication rules (see datasheets C5, C6 and C7);
- remind staff of break and meal times (possibly different times for different teams) ;
- motivate the staff, who may be discouraged by the length of operations or the high mortality rate.

At lunchtime:

- replace PPE where necessary;
- assess the staff's level of fatigue (organise a rota to ease the strain on staff);
- review the progress of each task, new animal intakes and staff requirements.

At the end of the day, before people leave:

- thank all those present that day;
- tell them when they can come back;
- record their departure (use the roll drawn up in the morning);
- give a final general overview to sum up the day, the work completed, the number of animals taken in and rehabilitated and the outlook for the following day.

Personnel management

Meals and accommodation:

Volunteers are generally provided with meals free of charge. Personnel should be appointed to manage cooking and provisions. During break times, someone will be tasked with distributing drinks and snacks, in a separate room from that used for caring for, cleaning and feeding the animals to ensure good standards of hygiene.

The rules concerning hygiene, safety and PPE should be displayed at each workstation entrance/exit.

On an exceptional basis, volunteers may be given accommodation on site if locally available (e.g. summer camp residence unoccupied in winter).

Accidents:

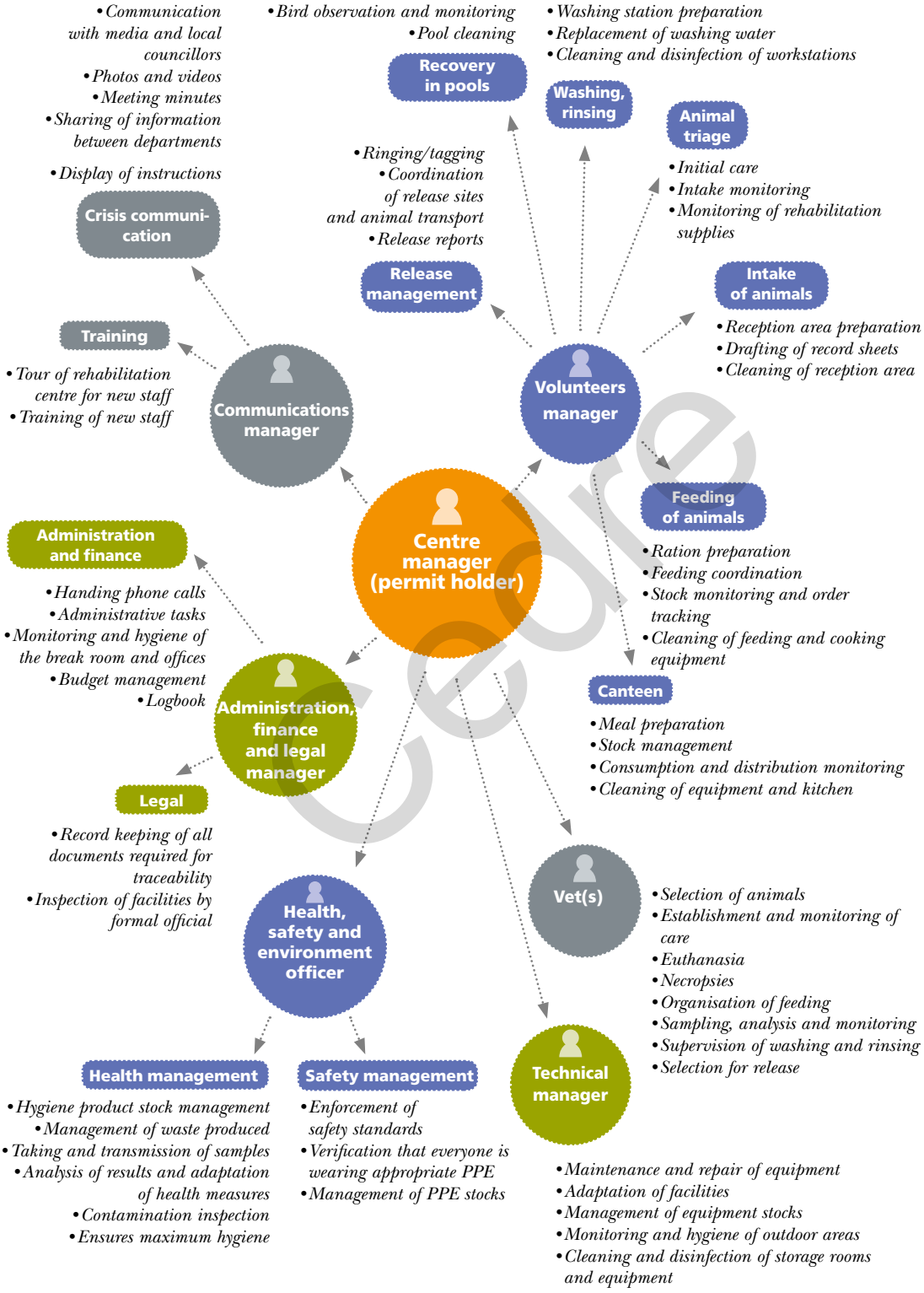
A pharmacy comprising first aid supplies must be available. A person should be placed in charge of its contents and management. The presence of a doctor may also be envisaged.

All injuries and accidents must be reported, recorded and followed up. Health procedures must be complied with to prevent contamination by pathogens.

Supervision:

The number of supervisors will vary according to the extent of the incident and the tasks conducted. As an indication, there should be one supervisor for 7-8 people for animal washing and feeding. Other tasks (maintenance and disinfection, meal preparation) require less supervision.

The role of the task leader is to ensure that his/her zone has all the necessary resources. The supervisor ensures that the work is performed correctly.



Rehabilitation centre organisation

Setting up a temporary centre: administration

To be legally compliant, when opening a temporary rehabilitation facility, various administrative procedures must be completed.

Getting informed

First, the authorities in charge of managing the emergency (Prefectures in France) must be contacted (if they have not already taken the initiative) to request further information about the incident and to find out about the wildlife response plan which may be in place. Thereafter, or if there is no wildlife response plan, the command centre must be informed of any risks the spill could generate for wildlife. It is also important to ask to receive regular updates on the situation and request to join the command centre.

Opening a rehabilitation centre

In France, setting up a temporary rehabilitation facility calls for close collaboration between the association or body managing it, a permit holder, the Prefecture, DREAL (Regional Directorate for the Environment, Planning and Housing), DDPP (Departmental Directorate for the Protection of the Population) and ONCFS (National Hunting and Wildlife Agency), or their equivalents in overseas France.

Once the premises have been found, set up or requisitioned, three types of authorisations are necessary and required throughout the emergency:

- **authorisation to open** issued by the Prefect and relating to the premises chosen for the temporary rehabilitation centre;
- **a certificate of capacity** issued by the Prefect and relating to the species to be taken in;
- **transport and release authorisations** for all the species concerned (however certain species require authorisation from the relevant ministry).

Setting up a team

A team of professionals should be set up as quickly as possible. It should comprise all the skills required to conduct all the duties to be performed by the centre: supervision and training, communication and information dissemination, care and rehabilitation, maintenance and logistics.

It is therefore useful, during the planning phase, to inventory the skills available in the local area, and even possibly to pre-identify one or more potential sites.

Rehabilitation centre: rehabilitators with a gannet

Receiving an oiled bird at a rehabilitation centre

Setting up a temporary centre: logistics

Setting up appropriate wildlife rehabilitation facilities is a determining factor in the success of operations. The facilities must be optimised to ensure they meet the necessary health and safety standards to promote smooth response operations.

Reminders:

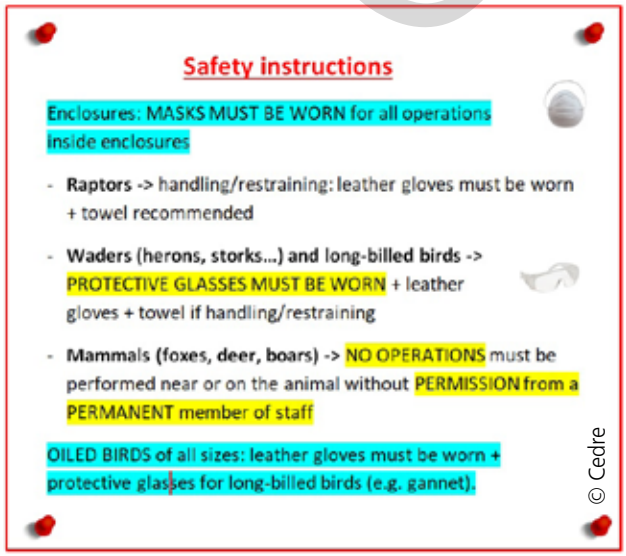
1) It is absolutely crucial that areas for the animals be separate from areas for personnel. The kitchen and rest area for volunteers and professional staff must therefore be separate from the wildlife reception and rehabilitation areas (feeding, hospitalisation, washing and drying).

   Each zone should have its own equipment which must not be swapped or lent between departments. Equipment used for humans (covers, cooking utensils, etc.) must never be used for animals and vice versa.

2) Always follow the work flow from animal reception to discharge. For obvious hygiene reasons, animals which have just arrived must be kept separate from those which have already been cleaned.

3) Eating and drinking are prohibited in areas where animals are present. The different zones must be kept as clean as possible, even throughout the day.

4) The health, safety and PPE rules should be displayed at each workstation entrance/exit.



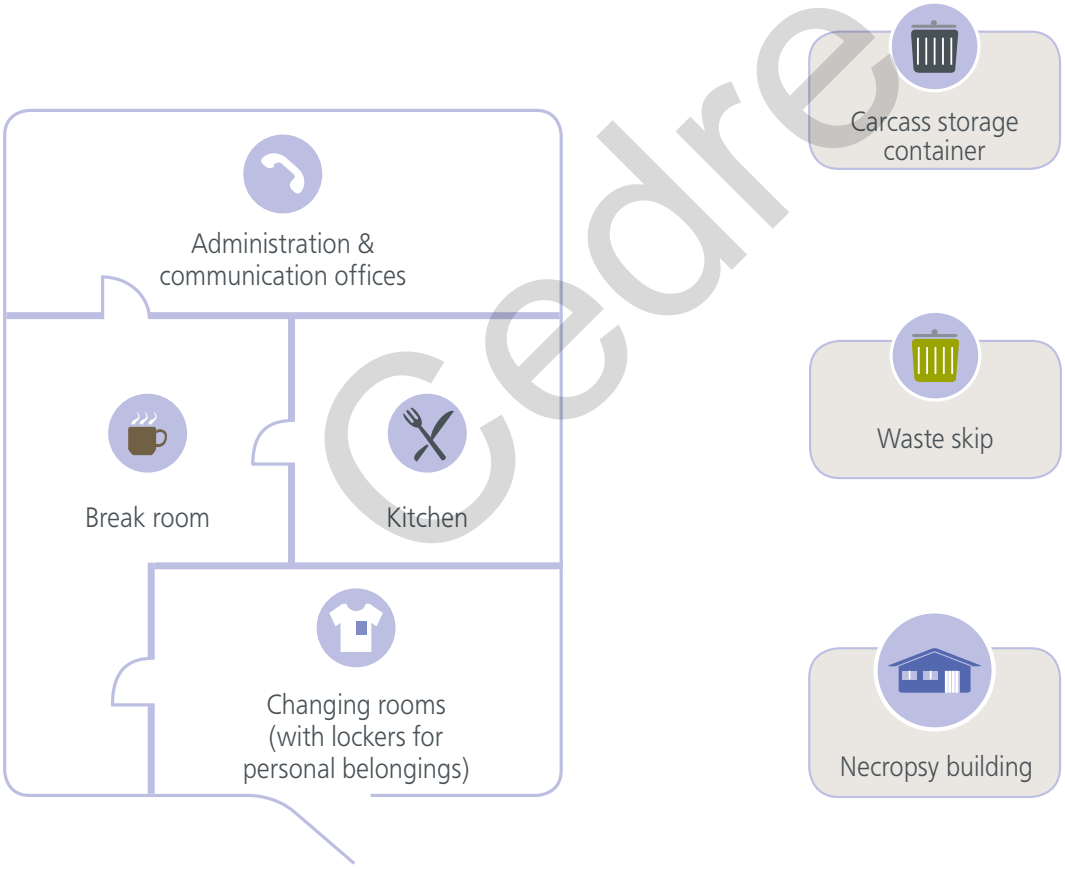
Safety instructions

The different areas required as well as the equipment needed are listed in the table below:

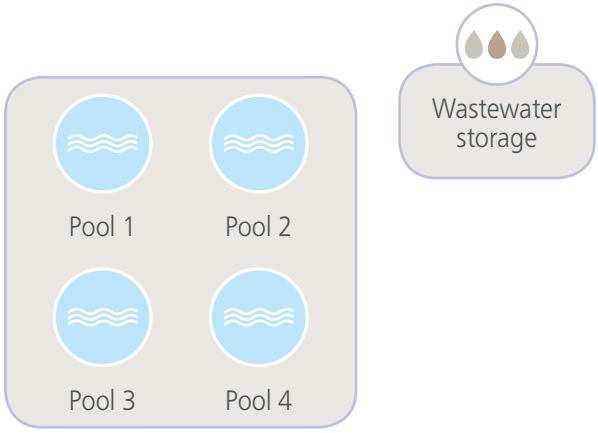
Area	Use	Equipment and recommendations
• Reception of animals	• Receiving transporters • Animal storage pending initial care	• Tables and chairs for operators • Telephone, computer and internet connection • Temperature maintained at around 20°C
• Initial care	• Animal triage • Administering initial care (rehydration)	• Veterinary equipment (tube, syringe, rehydration fluids...) • Temperature maintained at around 20°C • Waste containers (carcasses and surgical waste)
• Pharmacy	• Stockpile veterinary supplies	• Locked room
• Stabilisation	• Storage, feeding and stabilisation of animals before going to the washing room	• Storage either in cardboard boxes or in pens with several animals • Rooms kept at a temperature of around 20°C and preferably with natural light • Good ventilation
• Kitchen for the animals	• Preparing the animals' food	• Kitchen appliances (blender, various utensils) • Room with hot and cold water supplies • Refrigerator and freezer to store part of the food • Air conditioning if in a hot country
• Animal food storage	• Storing food for the animals	• Refrigerator and freezer • Room maintained at a temperature of around 15°C
• Washing	• Washing animals	• Hot water (washing between 40 and 50°C) and cold water supply; approx. 150 litres of water per animal • Evacuation of wastewater and contaminated water into sewerage system • Washing sink and/or basin • Worktop • Ideally a tiled room, or covered from floor to ceiling with a watertight tarpaulin • Room at a temperature of around 20°C • Good ventilation essential
• Drying	• Area for drying animals	• Drying pens • Efficient ventilation • Fan heater
• Pool	• Testing of animals' buoyancy and waterproofing and restoration of normal behaviour	• Ideally sheltered if outdoors • Filtration system (sand filter/UV filter) • May be above-ground or in-ground
• Break room	• For staff to rest and eat	• Hot and cold drinks available • Appliances such as kettle, coffee maker, etc. • Room at a temperature of around 20°C
• Kitchen for the team	• Meal preparation for the rehabilitation team	• Kitchen equipment (cooker, hob, cooking utensils, oven, gas stove, etc.)
• Changing room + toilet	• Staff comfort	• Room at a temperature of around 20°C, with benches, chairs, storage boxes • Hot and cold water supply (shower) • Lockers for volunteers to store their personal belongings
• Equipment storage	• Storage of maintenance equipment and PPE	• Storage boxes, cabinets...
• Administration	• Office space for telephone receptionist, and communication, financial and legal departments	• Telephone line, internet connection, desks, etc.
• Carpark	• Parking staff's vehicles without disturbing traffic	• Signposts: speed limit, traffic flow to prevent congestion
• Necropsy room	• Necropsies of carcasses and sampling	• Waste containers (carcasses and surgical waste) • Necropsy table • Surgical instruments • Freezer to store certain carcasses for subsequent analysis or usage
• Outdoor carcass bin	• Storage of carcasses pending removal by the renderer	• Container for storing carcasses • Must be sealed with an airtight lid to prevent scavengers

Setting up a temporary centre: layout

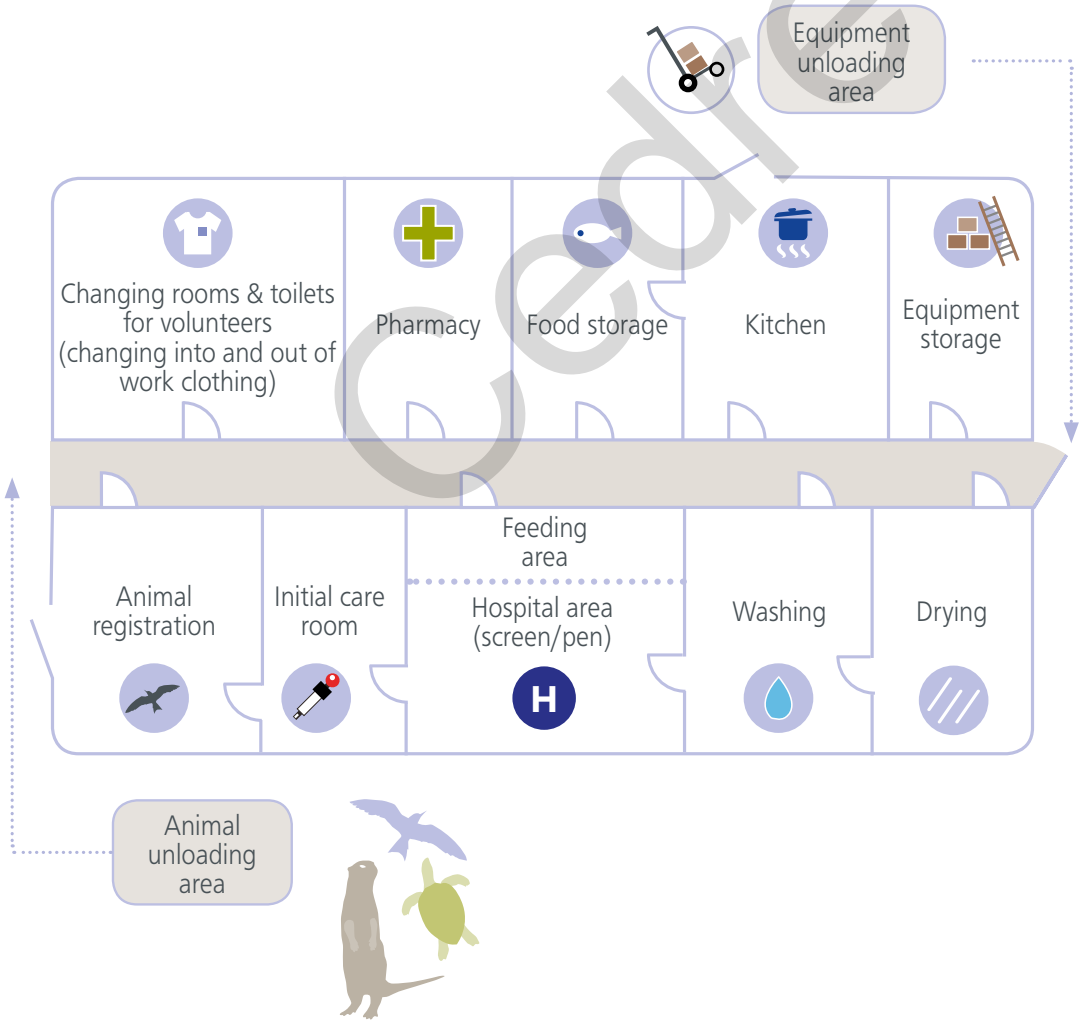
The floor plans presented below are examples. They should be adapted to best suit the existing facilities, the space available and access to certain resources. Part of the premises could be made up of existing buildings and/or temporary structures (prefabs, containers or tents).



Example of a possible layout of the administration offices and staff break room



Example of a possible layout of the rehabilitation pools



Example of a possible layout of the care and rehabilitation area

Data management

Animal monitoring

Animal identification

Monitoring animals throughout their successive transfers between departments can be difficult. In order to ensure the accurate traceability of these transfers, it is recommended that the animal be assigned the same number throughout the treatment chain. In practice, the animal is often re-registered each time it arrives at a centre. It is important to separate files for animals affected by the accident from those which are following "routine" treatment. The former can then be incorporated into the shared listing for the activity report.

The record sheet for the animal (see Appendix D4) should ideally be the same for all rehabilitation centres in order to standardise data-sharing between facilities but also to pool the data in order to carry out regular appraisals as well as a final incident assessment.

Animal record sheet

The animal record sheet is an important document that must be standardised. It allows veterinarians and rehabilitators to closely monitor each animal. For it to be functional, it should show, at a glance, the evolution of the animal's health, its weight chart and medication given to the animal during its time at the rehabilitation centre. Depending on the rehabilitation centre's facilities, this sheet may be digital or on paper. It should be kept up-to-date by professional rehabilitation staff.

Logistics and human resources

Good management of administrative tasks is important in order to keep the centre running smoothly. It is necessary to accurately monitor:

- staff engagement/disengagement (permanent and temporary staff);
- the equipment list on a daily basis (donations, purchases, loans...);
- the number of incoming and outgoing animals;
- events related to the incident;
- daily summaries for the authorities;
- incoming and outgoing mail;
- the circulation of informative documents;

A log book should be kept.

Rehabilitation staff briefing

Financial monitoring

Purchase orders, quotes, invoices, warranties, waste collection slips and carcass collection receipts must be kept, to account for any action the centre carries out or any reimbursement claims filed. Account management must be done daily.

The person in charge of accounting may also prepare funding and claims applications. This person must have experience in this type of work to avoid any loss or breach.

Internal communication

Within the rehabilitation centre

Communication between departments is absolutely crucial for the centre. All staff must work transparently and must inform the permit holder or centre manager of what happens during the day.

Short daily meetings should be scheduled (see datasheet C1). At the end of each meeting, the rehabilitation centre manager should assess the needs for the coming days.

Weekly meetings should also be held between all staff involved in the centre. During this meeting, the permit holder should give a review of the past week, explain forthcoming activities and remind everyone of the safety rules.

The minutes for every meeting must be kept to be used in reimbursement claims or legal disputes and to contribute to feedback.

The rehabilitation centre's supervisory team should share the same values and be consistent with each other when addressing volunteers. These volunteers provide back-up in the event of an incident; it is therefore reasonable for them to expect transparency in the actions and procedures of the rehabilitation centre.

Health and safety regulations as well as the centre's stance on questions such as the triage of birds or euthanasia must be clearly set out. An individual agreement form whereby the person agrees to abide by the centre's instructions and its health and safety regulations should be signed by every staff member.

Between different rehabilitation centres

Communication between rehabilitation centres is also essential. Ideally, all centres should use the same animal identification and counting system in order to ensure consistent figures. Database sharing should be considered in order to produce reliable figures.

Knowledge exchange is also important.

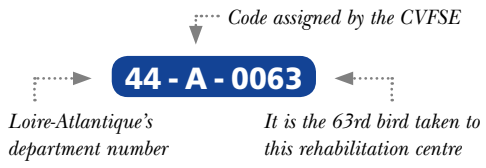
Identification difficulties

No system is perfect. Two suggestions are outlined below:

- Identifying animals via a national portal would make data-sharing easier and would ensure each animal retains the same number, from collection to release (or death). This would make drawing up the final review simpler since data would already be centralised and could be tracked in real-time. All the documents required for crisis management could also be stored in this space (animals' medical file, safety regulations, etc.).
- Identifying animals by a code, determined according to the collection site (a letter or initials), the area number or code, followed by a number assigned to the animal by order of collection.

Example:

In France, for the 63rd bird rescued in Loire-Atlantique area (administrative number 44) and taken to the Centre Vétérinaire de la Faune Sauvage et des Ecosystèmes (veterinary centre for wildlife and ecosystems) in Nantes: 44 - A - 0063



Managing media and institutional communications

Why are mobile phones a problem?

Due to the rapidity of information sharing, notably image sharing, mobile phones can be problematic. Volunteers should not take photos or videos, to avoid any unofficial communications appearing on social media. The public can be deeply moved by this type of event and certain practices (such as euthanasia or restraining techniques) are sometimes misinterpreted. In order to avoid a flood of comments and accusations, it is strongly recommended that the director considers formally banning mobile phones in areas where animals are present.

With the general public

A communications officer should be appointed to manage public relations, in conjunction with the authorities' public relations unit.

It is possible to include the media in events that are happening in the rehabilitation centre whilst also supervising and controlling what information and images they report on. In particular, it is necessary to explain certain practices (typically, euthanasia, which can be a source of dispute, even amongst permit holders). Journalists can be accepted in centres but only during specific time slots when they will cause least disturbance to the volunteers, while working in the best possible conditions. Information and photos sent to the media must be screened in order to limit misinterpretations and controversies.

Social media is increasingly where new and striking information is found and exchanged. It should therefore be used to inform the general public but also, for example, to make appeals for donations or volunteers.

Media reporting in a rehabilitation centre

Media presence during a release

With the authorities

The permit holder should regularly convene with the local authority (Prefect in France) concerning the progress at the rehabilitation centre. Close communication should be maintained between the centre, the incident management centre (in France the *Centre Opérationnel Départemental*), ONCFS (the National Hunting and Wildlife Agency), DDPP (the Departmental Directorate for the Protection of the Population), DREAL (the Regional Directorate for the Environment, Planning and Housing) – or their equivalents in overseas France –, Cedre and the local authority. These bodies exchange information and regularly review the situation. The director may also make contact with ONCFS (the National Hunting and Wildlife Agency) for the management of registers of incoming and outgoing animals. An official can also supervise animal releases upon agreement with the facility.

Between spill response coordinators

The permit holder should inquire about any possible animal arrivals as well as spill response measures by contacting the incident command post (*Poste de Commandement Opérationnel*, PCO). This centre works closely with organisations concerned with the rescue, triage and transporting of animals. It also works on a daily basis with the central government which authorises large-scale releases. In France, a representative from the rehabilitation centre should be in contact with the incident management centre or incident command post.

Health and safety

Registration form

Volunteers must complete a registration form (See Annex D3). This form will comprise their contact details but also, if possible, their vaccination record, allergies and relevant medical history as provided by the volunteers themselves. These documents are collected by the supervisors and stored in a locked cabinet for confidentiality reasons. Minors, pregnant women and people with feather and down allergies should not be involved in wildlife response operations. It is important to make sure that people with health problems are not involved in tasks beyond their capabilities.

Basic PPE

Operators must be given the appropriate protective equipment to ensure their safety. The rehabilitation centre must systematically provide equipment suited to the tasks to be implemented. This equipment should be replaced as often as necessary. The PPE provided should be selected according to each activity, based on the recommendations of the health administration.

The safety instructions should be displayed at the entrance/exit to each zone.

Examples of personal protective equipment

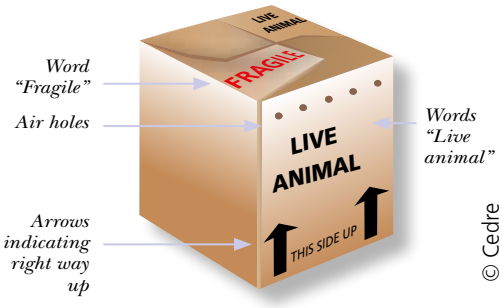
The following basic PPE can be mentioned:

Body part to be protected	Protection against	Recommended equipment
• Eyes	• Splashes of oil, droppings, food and chemicals • Birds' beaks	• Safety goggles • Protective mask • Face shield
• Head	• Impacts • Birds' beaks	• Protective helmet
• Body	• Extreme temperatures • Adverse weather conditions • Splashes of oil, droppings, food and chemicals	According to climate conditions: • Conventional or disposable protective suit • High visibility work clothes • Waterproofs
• Hands and arms	• Abrasion • Stings, bites, cuts and burns • Chemical and bacterial contamination	• Gloves (warning, gloves do not protect against all substances, see instructions)
• Legs and feet	• Stings, bites, cuts and burns • Oil and chemical spray • Abrasion • Moisture and slipping	Be aware that leather lets certain chemicals through (see instructions) • Safety shoes (or boots): strong soles, toe protection, gaiters
• Ears	• Noise at a level of 85 decibels or more	• Hearing protection
• Respiratory tract	• Gas emissions • Chemical emissions	• Full-face mask: with panoramic view, polycarbonate scratch-resistant face shield, air flow valve • Half-mask: air filtration system, respiratory tract protection against hazarous gases and vapours

Specific equipment is detailed in the relevant datasheets.

Capturing, restraining and transporting birds

Preparing a transport box for birds



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- Pierce air holes in the sides of the box (warning, make sure openings are not too large).
- Line the base with newspaper.
- Close with adhesive tape or string.
- Write on the box the species, place, date and time of capture, name and contact details of the finder, as well as the warning "Live animal".

What size of box for which bird?

- Small bird (e.g. guillemot): L = 40; W = 30 and H = 30 cm
- Large bird (e.g. gannet): L = 50; W = 35 and H = 35 cm

Capturing a bird

There are a few basic rules to capturing a bird to ensure it is a calm procedure generating as little stress as possible for the animal and as little risk as possible for the people involved. The aim is to take the bird by surprise to prevent it from attempting to escape or defend itself. To effectively capture a bird, it is important to work calmly with precise movements.

- At least two people are required.
- Position yourselves between the bird and the sea to stop it from returning to the water.
- Walk slowly towards the bird, but not directly facing it.
- Use rocks and obstacles to approach the bird without being seen.
- Use a net (or scoop net) to catch it.
- Beware of its beak, make sure you keep it away from your face.
- Remove the bird from the mesh of the net by pinning it to the ground and holding its wings against its body.


© Anne-France Touveron/LPO

Capturing a bird using a tarpaulin


© Sea Alarm

Bird capture exercise using a scoop net (simulation)

C8

Restraining a bird

Small birds

(can be easily carried alone):

- Make sure you are wearing leather gloves before touching the bird.
- Hold its wings against its body, circling both hands around it: known as the "rugby ball" hold.
- Make sure you grasp the bird from behind so that you are as far away as possible from its beak.

Large birds

- Make sure you are wearing suitable gloves before touching the bird.
- First control the beak (the beak of cormorants and gannets must be held open, as they do not have external nostrils) and hold their wings against their body.
- Hold the bird against you at hip height, using your other hand to restrain the body, wings and legs: the so-called "guitar" hold.
- If two people are restraining the bird: one person should control the animal's head and the other its body.

Transporting a bird

- Place the bird in the box and close it with adhesive tape or string.
- If possible, store only one bird in each box (for sociable species that do not tend to be aggressive, if there is a shortage of boxes, 2 or 3 birds may be placed in the same box).
- Use a closed, well-ventilated vehicle (not a pick-up truck) with a separate cab.
- Lay the boxes flat in a single layer to prevent the animals from being crushed or from suffocating.
- Do not squeeze the boxes together too tightly to allow adequate ventilation between boxes.
- Set the heating (or air conditioning in hot conditions) to a warm temperature (22-26°C) if the animals are wet and oiled; set the heating (or air conditioning in hot conditions) to a slightly cooler temperature (18-22°C) if they are dry.
- Drive at low speed and avoid sharp turns and sudden braking.
- Be as quiet as possible, do not switch on the radio or speak too loudly.
- Do not smoke.
- Take the birds by the most direct route to a wildlife rehabilitation or rescue centre where they will receive appropriate care.

The "rugby ball" hold

The "guitar" hold

Capturing, restraining and transporting pinnipeds

Preparing a transport crate for pinnipeds

- Transport animals in an appropriate container in terms of their size and behaviour.
- Ideally, use a plastic container, which will be easy to clean and disinfect, with a lid and air holes. The minimum dimensions should be 1 m (length) x 60 cm (width) x 50 cm (height) for animals weighing 11 to 15 kg.
- If unavailable, use wooden crates, taking extra care when disinfecting and cleaning them.
- Fill in a form specifying the species, place, date and time of capture, name and contact details of the finder and the warning "Live animal".

© Cedre

Transport crate for a young pinniped

Capturing a pinniped

Minimise the animal's stress by maximising operator safety:

- approach the animal as a team of two or three people. The person tasked with restraining the animal should be trained in doing so.
- wear very thick leather gloves, and boots.
- attract the animal's attention to distract it while the second operator approaches. Let it grasp the first operator's clenched fist.
- Grab it by the hind flippers, lift it up keeping your arms stretched out to prevent biting (with the animal's stomach facing the operator).
- Possibly use a cloth to cover its head during the approach phase.
- Place the animal in a transport crate and close it securely.

© Océanopolis

Capturing a stranded grey seal

N.B. 1: according to the animal's age, it may be heavy to carry, leading to an increased risk of bites to the legs. In this case, tilt the transport crate on its side and tip the animal into it using a herding board, then tilt the crate upright.

N.B. 2: if lifting the animal directly, always keep its stomach facing you. It would be dangerous to have the animal's back towards you. The animal could curl its body upwards in an attempt to free itself. The risk of biting is greater, as the animal has a major pivotal point at the pelvis and flippers.

Restraining a 2 or 3-day-old grey seal pup for rehabilitation

Restraining a 2 or 3-day-old grey seal pup for rehabilitation

Transporting a pinniped

- Use a well-ventilated, watertight, washable vehicle with fluid drainage.
- Transport the animal in dry conditions rather than in water.
- In the case of high outdoor temperatures, cool the animal with a sprayer.
- Hydrate the flippers (pinnipeds use their members to regulate their body temperature) and head as a priority.
- Drive at low speed and avoid sharp turns and sudden braking.
- Be as quiet as possible.
- Do not smoke.
- Take the animals to a wildlife rehabilitation or rescue centre by the most direct route.

A grey seal arriving at the clinic and being unloaded by rehabilitators

Capturing, restraining and transporting otters

Preparing a transport crate for an otter

- Place the otter in a transport crate (ideal dimensions between 80 cm x 50 cm x 60 cm and 90 cm x 60 cm x 60 cm).
- If possible, place a grate in the bottom of the crate to prevent excrement from further fouling its fur.
- Ensure the crate is properly closed.
- Fill in a form specifying the species, place, date and time of capture, name and contact details of the finder and the warning "Live animal".

Otter transport cage

Capturing an otter

On the shore:

- At least two people are required for capture.
- Wear very thick leather gloves: never capture an otter with bare hands. As they have very loose fur around the neck and tail, the risk of bites is very high, even by a pup, except if it is very young or very weak.
- It is possible to capture the animal using a scoop net, a net or a cage with a bait.
- Throw the net/scoop net over the animal and immobilise it.
- Grasp it by its rear legs or the base of its tail to lift it; keep your arms straight while carrying the animal.

On water:

- Approach by boat.
- At least 3 people are required (1 to drive the boat, 1 for the net and 1 for restraining).
- Use a scoop net at least 80 cm in diameter.
- Approach the animal quickly and reverse as the person captures the otter in the scoop net.
- Keep the otter against the hull of the boat, at the surface, to immobilise it.
- Have two handlers wearing gloves transfer it into the transport crate.

Transporting an otter

- Use a well-ventilated, watertight, washable vehicle with fluid drainage.
- Place a chew toy in the cage to entertain the otter and prevent it from grooming itself during the journey.
- If the animal is suffering from hyperthermia (when stressed otters become hyperthermic) and the outside temperature is high, place the otter on a layer of ice covered with a towel.
- Keep the temperature in the vehicle at around 20°C.
- Drive at low speed without any sharp turns or sudden braking.
- Be as quiet as possible.
- Do not smoke.
- Take the animals by the most direct route to a wildlife rehabilitation or rescue centre where they will receive appropriate care.

Animal reception and intake

Reception, a key stage

Reception is the stage during which animals transported from the beach are taken to the closest appropriate collection and triage facility or rehabilitation centre (the facility to which they are first admitted or another).

This position requires administrative skills, the ability to carry heavy loads and high stress tolerance.

The people working at reception should gather the available information for each animal and ensure that this information remains with it throughout the rehabilitation process.

It is important to obtain some basic information from the transporter if nothing is inscribed on the transport box. Enquiries should also be made into any treatments already administered or actions taken. All the information gathered should be recorded in the animal's medical record sheet.

The reception zone should be empty at the end of each day, all the animals should have been treated on site or sent to a collection facility or rehabilitation centre. The rehabilitation centre may be open around the clock according to the scale of the incident, or at least from sunrise to sunset.

Rehabilitation centre admission

Animal admissions at the rehabilitation centre should be coordinated by an experienced member of staff who is able to examine the animal and rank it by order of priority. It is at this point that all animals admitted to rehab should be identified with a ring or tag bearing a unique number. They should also be attributed a form with the results of the initial health examinations and treatments to be administered. All animals admitted to the rehabilitation centre should be recorded in an official register.

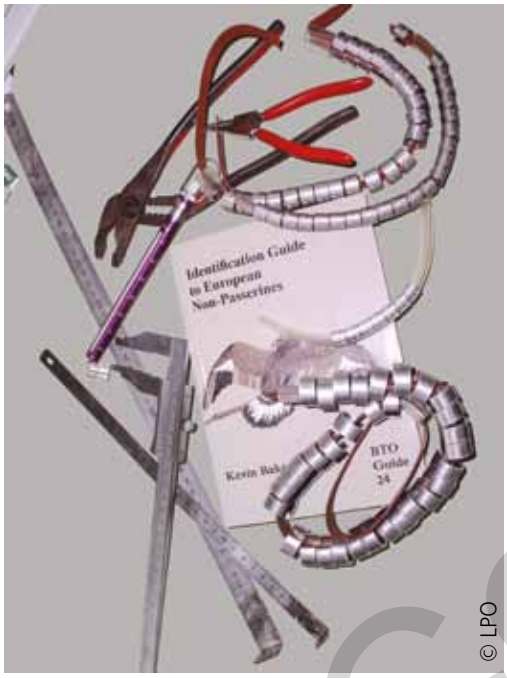
Animal registration

Practices and opinions on animal registration tend to vary (see datasheet C5 and Annex D4). Should a unique number be attributed when the animal first enters the chain? Should it be re-registered when admitted to the rehabilitation centre?

Once the registration process has been defined, birds should be ringed in order to be identified. Pinnipeds and otters may also be temporarily marked (inscription that will last until the next time they shed their fur). Turtles can be ringed or their shell can be marked (this will fade with time).

© Cedre

Close-up of a pinniped identity tag



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Bird ringing instruments

© LPO/Gilles Bentz

Animal intake monitoring chart

© Gilles Bentz - LPO

A ringed guillemot

Physical examination and triage of birds

The purpose of a rehabilitation centre is to rehabilitate animals then release them into the wild once they have recovered their physical and behavioural capacities required to live autonomously in the natural environment. Individuals with irreversible damage preventing them to do so will therefore have to be euthanised.

What are the main bird triage criteria?

With birds, triage should take place as soon as possible after they arrive at the rehabilitation centre to avoid unnecessary suffering. This also means that the available resources can be devoted to animals with the highest probability of survival during rehabilitation and therefore the highest chance of being released.

Triage criteria will depend on the type of animal affected ("medical" criteria) and the resources available ("non-medical" criteria). Thus, according to the circumstances, the decision may be made to euthanise certain animals which could be considered for rehabilitation in order to focus available resources on certain species or populations considered at threat.

Examples of "medical" criteria:

- overall condition of the bird (degree of dehydration, weight and body condition, plumage condition related to type of oil involved, responsiveness);
- presence of an infectious contagious disease liable to trigger an epidemic;
- amputation of a limb or extremity;
- a contaminated open fracture;
- an incurable eye lesion significantly impairing the animal's vision;
- a nerve lesion;
- a completely fractured beak.

Examples of "non-medical" criteria:

- the type of pollutant (toxicity, adherence, etc.);
- the species concerned (conservation status);
- the number of birds affected;
- the resources available;
- the constraints involved in setting up a rehabilitation centre;
- the age and sex of the animals.

Triage of birds following their arrival at a rehabilitation centre

Gannet awaiting physical examination

What equipment is required for physical examination?

Basic equipment and supplies:

- clean, disinfected examination table;
- gloves (ideally nitrile);
- leather gloves for restraining the animal;
- cloth for enveloping the animal;
- ophthalmoscope;
- gauze and disinfectant such as chlorhexidine;
- absorbent pads, cotton buds and eye wash;
- round tip tweezers;
- syringe and needles in case samples are to be taken.

The physical examination can be performed by two people if required given the size of the bird (e.g. gannet). A veterinarian or experienced rehabilitator may be assisted by a volunteer to restrain the bird if necessary. However, only the veterinarian is qualified to establish the final diagnosis. He/she then recommends the appropriate course of action.

A third person records the information on the bird's medical record sheet. He/she may also prepare the bird's ring with its identity number.

Bird physical examination station

Physical examination of a guillemot

Physical examination and triage of pinnipeds

The purpose of a rehabilitation centre is to rehabilitate animals then release them into the wild once they have recovered their physical and behavioural capacities required to live autonomously in the natural environment. Individuals with irreversible damage preventing them to do so will therefore have to be euthanised.

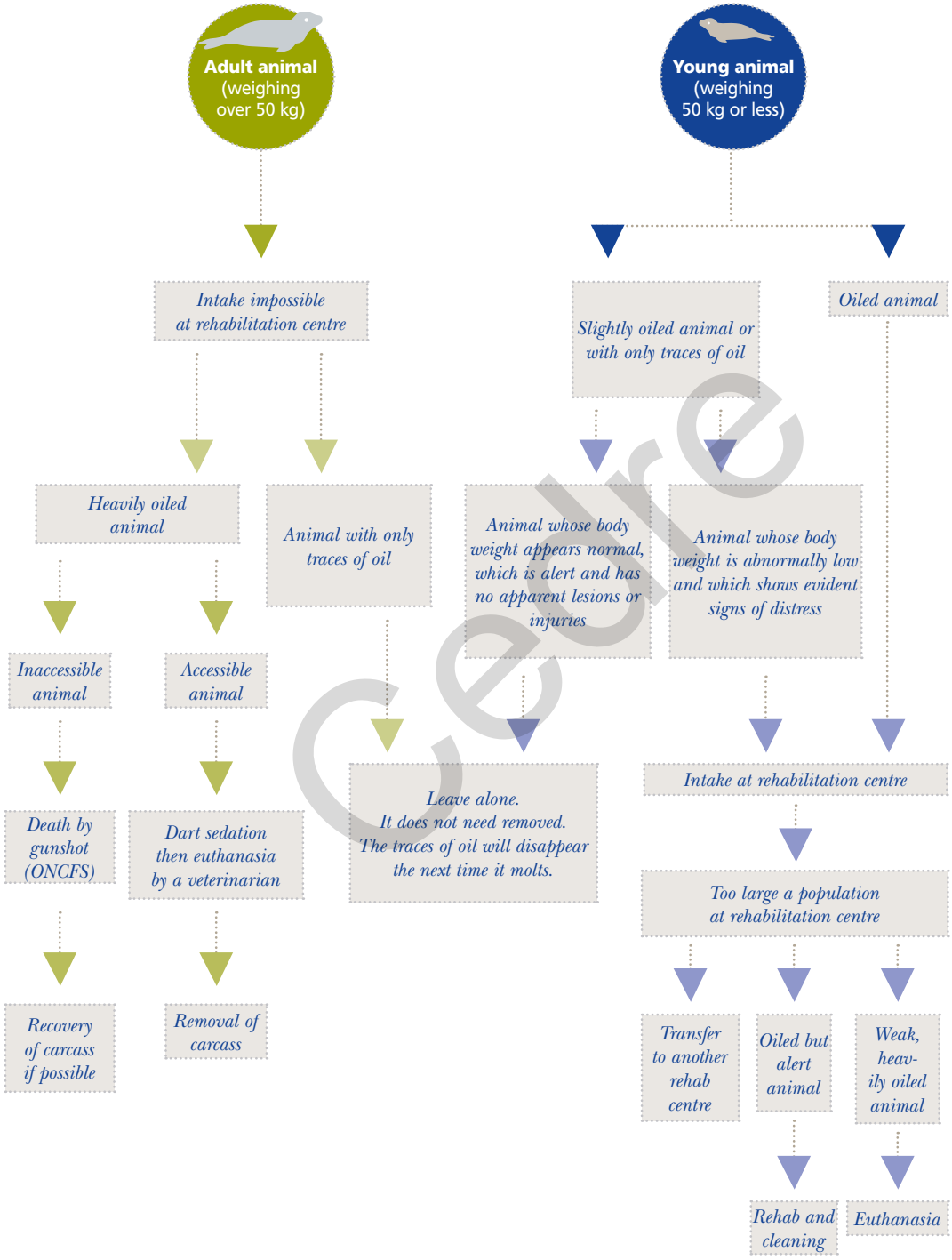
The admission of pinnipeds is limited by their mass and accessibility. For safety and logistical reasons, only young individuals may be rehabilitated. As oil does not affect their movements, capture can sometime prove to be a tricky and dangerous task. Triage criteria therefore differ from those for birds.

C13

Holding pen for a seal

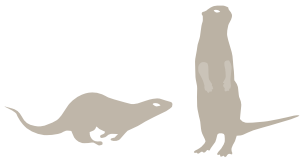
Rehabilitating a 2 or 3-day-old grey seal

Taking an x-ray of the jaw of a young female grey seal at a veterinary clinic



Triage and admission criteria for pinnipeds

Physical examination and triage of otters



The purpose of a rehabilitation centre is to rehabilitate animals then release them into the wild once they have recovered their physical and behavioural capacities required to live autonomously in the natural environment. Individuals with irreversible damage preventing them to do so will therefore have to be euthanised.

Otters should be treated very soon after being captured to prevent unnecessary suffering. Oil causes hypothermia by clogging their fur. Furthermore, as otters groom themselves, they are liable to ingest particles of the pollutant. Otters should be taken in by an accredited rehabilitation facility with the necessary infrastructures to accommodate them.

C14

Triage criteria will depend on the type of animal affected ("medical" criteria) and the scale of the crisis ("non-medical" criteria).

With otters, triage should take place as soon as possible after they arrive at the rehabilitation centre. Triage is always carried out under veterinary control.

Examples of "medical" criteria:

A veterinarian will determine the level of urgency of rehabilitation:

- low: the otter is slightly oiled and not showing signs of distress;
- moderate: the animal is oiled and showing moderate signs of deterioration of its overall condition (dehydration, hypothermia, etc.) without impairment of vigilance;
- high: the animal is oiled and shows evident signs of deterioration of its overall condition (dehydration, hypothermia, diarrhoea, vomiting, etc.) with impaired vigilance (marked hypoglycemia). The animal therefore requires rapid attention and intensive care or to be euthanised.

Examples of "non-medical" criteria:

- the type of pollutant (toxicity, adherence);
- the number of animals affected;
- the resources available (number of rehabilitation centres involved, number of experts or volunteers);
- the constraints involved in setting up a rehabilitation centre;
- the age and sex of the animals.

All the information obtained following the physical examination should be recorded on the individual's medical record sheet.

Examining an otter

Housing of birds

A few basic rules for housing birds

- Do not mix individuals of different species in the same pen to prevent unnecessary conflict and stress.
- Categorise birds from dirtiest to cleanest and sort into groups according to the condition of their plumage.
- Never place birds which have already been cleaned with birds that are still oiled.
- If individuals generate problems within the group, isolate them in an individual pen.
- "Stimulator" birds (able to self-feed) can be placed in the pens to stimulate the others.

The temperature should be between 20 and 25°C to restrict germ development and the spread of pathogenic agents. The room should be well ventilated.

Building a pen

Whenever possible, pens should be divided into two sections with a removable partition. The two sections can be used alternately. Each time after handling, the birds are placed in the clean section, meaning that the dirty section can be cleaned straight away.

- Line the base of each pen with newspaper so that it is easy to clean.
- Use nets or absorbent, non-biological materials for the floor of the pen.
- Line the sides of the pen with a plastic tarpaulin (preferably light-coloured or transparent) to facilitate maintenance.
- As certain species (gulls, skuas) tend to try to fly away, stretch a net across the top of each pen to prevent them from escaping.
- Separate the pens with a tarpaulin curtain to provide a calm environment.

Bird holding pens

Gannets in a pen

The right pen according to bird species

- L = 2 m; W = 1 m and H = 0.5 m for small birds such as auks and ducks.
- The recommended density for such birds is 10-15 birds per m² in the feeding room and 5-10 birds per m² in the drying room or intensive care.
- L = 2 m; W = 1 m and H = 1.2 - 1.5 m for large birds such as gannets, cormorants or divers. As these birds are more sensitive to stress and more liable to escape, the sides of the pens should be higher. The recommended density for such birds is around 5-6 birds per m² in the feeding room and 3-5 birds per m² in the drying room or intensive care.

Puffins in a pen

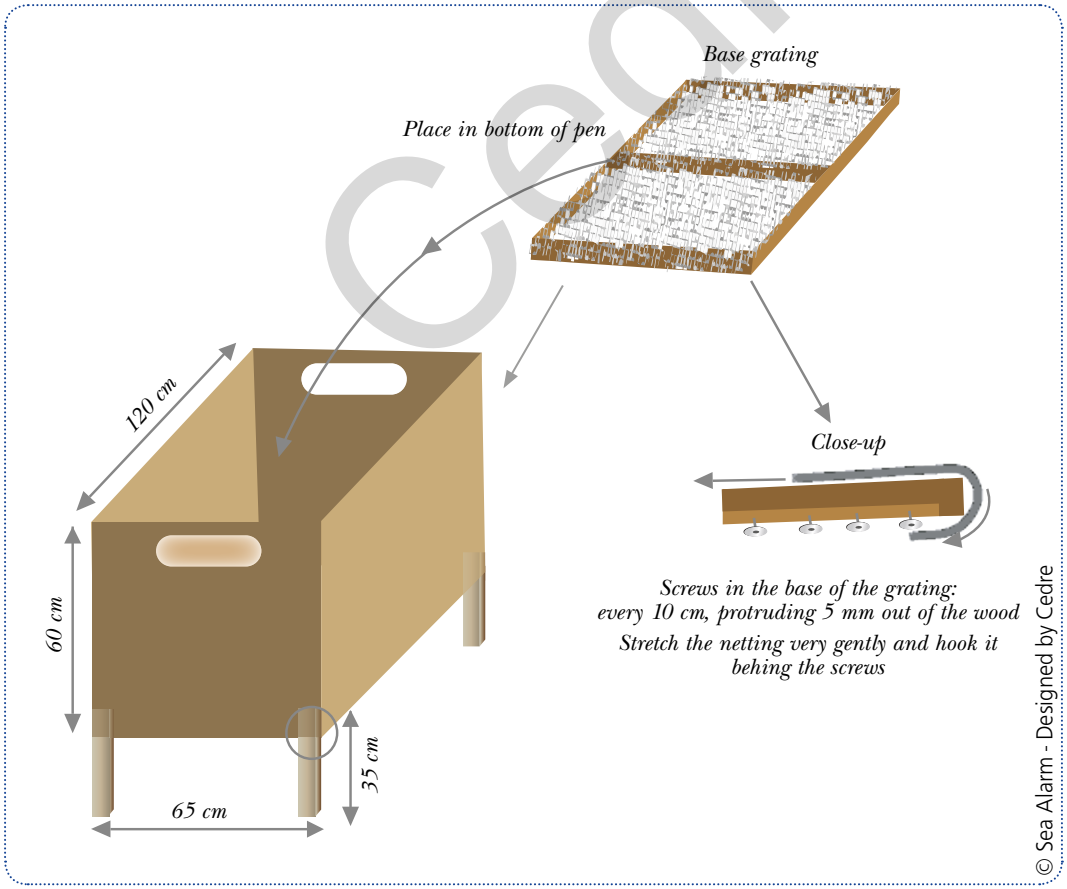


Diagram of a standard pen

Housing of pinnipeds

A few basic rules for housing pinnipeds

Pinnipeds have a thick layer of subcutaneous fat, known as blubber, which effectively protects them against the wind and cold. The temperature need not exceed 18°C in oiled wildlife rehabilitation facilities. As these animals can spend several weeks out of the water, the stabilisation period takes place in pens.

Ideally, the animals should be kept in individual pens to prevent conflict and allow close monitoring. The holding facility must be well ventilated.

Faeces should be removed twice a day. For the first cleaning, the pen should be washed with detergent and the grating soaked in bleach. It is important to rinse the pen to remove all traces of the washing agent. The second cleaning can be performed with fresh water.

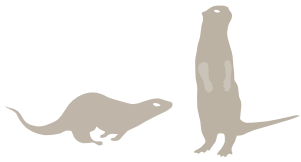
Building a pen

- Minimum pen size: L: 1.20 m, W: 90 cm, H: 1 m.
- The animal must be able to turn around in the pen.
- Grating placed on the floor of the pen to facilitate the removal of excrement.
- Pen sides made of a highly resistant and easily washable material.
- The floor of the pen must be easily washable.

Juvenile grey seal in a pen

Rehabilitating a 2 or 3-day-old grey seal in a pen

Housing of otters



A few basic rules on housing otters

The adult Eurasian otter is a rather solitary animal which it is preferable to place in individual pens, unlike the sea otter which is more social. Young individuals may be kept together in small groups. Otters can also be kept in large and sufficiently strong pet transport boxes.

Building a pen

- The pens must have totally smooth sides. Otters are excellent climbers and are able to grip in the slightest crack.
- If the sides are not smooth, the top of the pen must be closed to prevent the animals from escaping.
- The floor of the pen must be easily washable.
- The base may be lined with towels or fabric to provide thermal insulation; they should be replaced every day.

The pen or cage must be large and wide enough for the animal to turn around (minimum dimensions: 82 cm x 56 cm x 58 cm and 92 cm x 60 cm x 66 cm).

C17

Otter in a cage

Otter in a pen

Rehabilitation of birds

Initial care

Initial care is given as soon as the animal is admitted to a forward holding centre or rehabilitation centre. It aims to reduce the direct effects of oil on the organism (irritation, toxicity) as well as to mitigate their consequences. To do so, a few simple actions are carried out:

- Clean the oil from the nares and eyes (using a cotton bud soaked in eye wash), in the oral cavity and remove the bulk of the oil from the feathers (with absorbent paper).
- Rehydrate the bird orally using suitable warmed solutes.
- Warm the bird up with heating pads or lamps (ensure that the animal can move away from the heat source unaided).
- In case of high outdoor temperatures, take measures to prevent hyperthermia.
- Keep the bird in a calm place (minimal noise and visual disturbances) pending transport or further medical stabilisation treatment.

Treating a gannet's eyes

Medical stabilisation

Birds are generally very weak when recovered on beaches and therefore cannot cope with the stress of cleaning immediately after collection. A medical stabilisation phase is therefore necessary to prepare the birds for cleaning. This phase seeks to provide rest and support vital functions. The aim is to achieve an improvement in the animal's overall condition: good digestive transit, spontaneous feeding, pruning behaviour, interaction between individuals. This phase lasts at least 48 hours and should not exceed 5 to 7 days, beyond which there is a risk of secondary health problems due to captivity and/or the rehabilitation process. The decision to clean each animal is made jointly by the veterinarian and experienced rehabilitation staff (rehabilitators, washers).

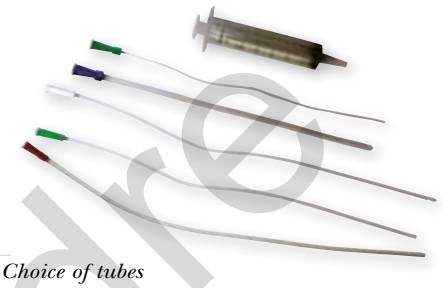
- **Stress reduction and prevention:** place the animals in a calm place, keep handling to a minimum by anticipating the treatments to be implemented.
- **Hypothermia prevention:** keep the birds (physiological temperature of 40 - 41°C) at moderate room temperature (18 - 20°C) with a heat source (e.g. heat lamp). Make sure they can move away from the heat source if they wish to.
- **Dehydration prevention:** rehydrate the bird orally using suitable warmed solutes (3 times a day for 2 to 3 days).
- **Gradual reintroduction of food:** use small quantities of highly digestible foods to re-accustom their digestive tract to food. Check the consistency of droppings. As soon as this has returned to normal (12 to 48 hours), offer high quality natural foods (at least 3

times a day), in sufficient quantity and correctly thawed (internal temperature of fish between 10 and 15°C). When stressed, certain species will not feed and will require to be force fed (e.g. gannets).

- **Prevention of secondary health problems:** waterfowl can suffer from health problems due to being kept in an unnatural environment. Ensuring there is good ventilation and gradually reintroducing food will reduce the risk of pulmonary ailments. Correctly prepared pens and well mastered restraint, capture and force-feeding techniques will reduce the risk of pressure sores.

How to rehydrate a bird

1) Choose a tube that is long and rigid enough to easily reach the bird's gizzard (stomach). The type of tube will depend on the species.
2) In advance, prepare the rehydration solution (freeze-dried rehydration mix to be dissolved in drinking water, isotonic solutes or, if unavailable, drinking water alone) or highly digestible suspension, warmed to (38 - 40°C), in a syringe. The recommended dose is 40 to 50 mL of fluid per kg, 3 times a day.
3) Open the beak and extend the neck in line with the spine. Attach the syringe filled with fluid to the tube and insert the tube into the oesophagus by introducing it into the right side (for the bird) of the trachea.
4) Ensure that the tube has reached the gizzard.
5) Slowly inject the contents of the syringe, watching out for any reflux of the fluid into the oral cavity which could then enter the trachea.
6) Slowly remove the tube, pinching it to prevent any drops of fluid from entering the trachea.
7) Clean and disinfect the equipment used, in particular the gavage tube.
8) Repeat this operation three times a day.



Choice of tubes

Inserting a tube through a bird's beak down to the gizzard

Removing the tube while pinching it to prevent reflux

Rehabilitation of pinnipeds

Treatments

Only young seals should be collected for rehabilitation. They will then be kept at the rehabilitation centre until they have a sufficient body mass to be autonomous in the natural environment (between 40 and 50 kg) and have recovered normal feeding behaviour. There is therefore no stabilisation stage like for seabirds prior to washing.

Upon arrival at the rehabilitation centre, the seal is first rehydrated for 24 hours before fish gruel is introduced. The gruel is gradually thickened over a number of days, leading to the introduction of whole fish. The indicator that the animal is ready for this stage is stool consistency. When the consistency is normal, food can be given in solid form.

C19

How to rehydrate a pinniped

Equipment required:

- thick leather gloves;
- rigid PVC thumb guard;
- tube of sufficient diameter and length;
- funnel;
- rehydration solution.

Leather gloves for handling pinnipeds as well as birds and otters

Ringer's solution and glucose solution with a funnel for rehydrating a seal

Procedure:

1) A team of at least two people is required to handle the seal (see datasheet C9).
2) Place the animal on the ground on its front.
3) Straddle the seal while the other person controls the animal's neck and head to prevent bites.
4) Control the animal's neck. Beware of the animal turning round and biting.
5) Protect your thumb with a PVC thumb guard, wear a thick leather glove and let the animal "bite" down on your thumb.
6) Tube the animal by inserting the tube into its oesophagus.
7) Pour the rehydration fluid into the tube using a funnel.
8) Then pinch the tube.
9) Return the animal to its pen, following the restraining instructions during transport as described in datasheet C9.

Rehydrating a pinniped

Rehydrating a pinniped

Rehabilitation of otters

Initial care

Initial care aims to mitigate the direct effects of oil on the organism:

- Clean the oil from the nares and eyes (using a cotton bud soaked in eye wash), in the oral cavity and remove the bulk of the oil from the fur (with absorbent paper).
- Rehydrate the otter orally using suitable warmed solutes.
- Warm the otter up with heating pads or lamps (ensure that the animal can move away from the heat source unaided).
- In case of high outdoor temperatures, take measures to prevent hyperthermia.
- Keep the animal in a calm place.

Feeding and physical examination

Medical stabilisation

Due to the stress caused by handling, the medical stabilisation phase is vital prior to considering cleaning an otter. Cleaning often requires the use of sedatives to mitigate risks for staff.

- **Stress reduction:**
  Place the animals in a calm place, keep handling to a minimum by anticipating the treatments to be implemented.
- **Hypothermia prevention:**
  Keep the otters at moderate room temperature (18 - 20°C).**If its rectal temperature falls below 36°C**, the otter is hypothermic (shivering, lethargic). It should be warmed up and kept on a dry, absorbant substrate. **If its rectal temperature exceeds 39°C**, the otter is hyperthermic (agitation, panting). It should be placed on a bed of ice.
- **Dehydration prevention:** Rehydrate the otter orally with warmed sterile isotonic solutes, if the animal is cooperative, or subcutaneously. Keep handling to a minimum and encourage the animal to drink on its own by providing fresh water. Very weak animals which have been selected from rehabilitation during triage can be put on an intravenous drip.

- **Gradual reintroduction of food:**
  Introduction of fish gruel, possibly mixed with easily digestible meat (chicken heart or minced meat). According to the physical condition of the otter, force feed or provide food. It is rarely possible to feed otters using a gavage tube.

- **Prevention of secondary health problems:**
  Digestive problems can occur if food is reintroduced too quickly or with fish that is not freshly thawed. Pressure sores often appear on otters' paws if they are kept in captivity on a smooth surface for long periods of time. Well mastered capture and restraint techniques will reduce the risk of injuries.

Rehydrating an otter

Feeding birds

What to feed birds

It is essential to cater for the nutritional requirements of each different species by providing suitable food according to the birds' needs and usual diet in order to reactivate their natural feeding habits as early as possible. The appropriate quantities and type of foods for each species will be determined by the veterinarian.

According to the physical condition of each bird, the veterinarian will define the feed protocol to be followed and the food to be prepared.

Food type	Preservation/preparation	Delivery methods
• Fresh fish	• Store in refrigerator without water for up to 36 hours	• Freely available in water • Force feeding in beak
• Frozen fish	• Store in freezer • Thaw slabs of fish in a basin of cold water (never hot water) • Rough indication of thawing time for one slab: 10 to 12 hours • Detach the fish carefully to prevent damaging their flesh	• Freely available in water • Force feeding in beak
• Frozen pre-prepared fish gruel	• Often in the form of frozen slabs, can be bought from specialised suppliers • Thaw in a basin without water for 8 to 10 hours	• Tube feeding
• Fish gruel made from fresh or frozen fish	• Grind the fish in a blender (must be powerful enough to blend fish bones and heads) • Possibly add vitamins, water or rehydration solution • Ensure appropriate consistency (must be able to be delivered by tube)	• Tube feeding
• Specialised formulas	• Specifically formulated pellets for certain birds (e.g. swans or ducks) • Recipes specifically developed by rehabilitation centres	• Freely available (in water or not according to feed type) • Tube feeding after blending and mixture with water or rehydration solution

N.B. : So-called "oily" fish (such as sprat or mackerel in the North Atlantic) are mainly used during the stabilisation phase to promote weight gain. "Lean" fish (such as smelt or capelin for the northern hemisphere) are used once the birds are in pools to prevent their droppings from making the water oily.

Rehydration equipment

Feeding birds with fresh fish

Feeding pinnipeds

What to feed seals

Seals are primarily piscivorous.

Fish gruel can therefore be prepared during the initial rehabilitation phase. Select so-called "oily" fish which will offer a higher protein intake than "lean" fish. Herring and mackerel are the most appropriate choices (north hemisphere).

How to make fish gruel

- Select good quality, fresh fish. They may be thawed in cold water for several hours prior to use.
- Remove the heads and bones to obtain fillets; for mackerel, remove the skin as it is difficult to blend and can block the tube;
- Blend the fish.

How to feed an adult pinniped

Early rehabilitation

- Feed grey seals or harbour seals fish gruel that is as liquid as possible. To do so, add some rehydration solution (mixture of Ringer's solution and 5% glucose) to the fish gruel.
- Increase the consistency gradually each day.

It can also be beneficial to add nutritional supplements. The handling protocol for feeding is similar to that for rehydration (see datasheet C19), the only difference being that the gruel is contained in a gavage syringe which is connected to a tube.

C22

Example of a gavage syringe used for pinnipeds

As soon as the animal's stools show normal consistency:

- feed whole fish;
- initially, start by force feeding by introducing the fish into the pinniped's mouth;
- once this method has been accepted, leave the animal in its pen and present the fish head down (holding it by the the tip of the tail). The pinniped should then be able to seize the fish;
- feed seals twice a day;
- make sure no fish are dropped into the pen or if this occurs recover them to prevent contamination by the animal's excretions.

Preparing food

The case of pups

If an unweaned pup is taken to the rehabilitation centre, it should be fed milk to which small rations of fish gruel will be added until the pup is ready to be weaned. The quantity of food required represents around 4 to 5% of its body weight. The frequency of feeding will be higher than for an adult seal (small quantities every 3 to 4 hours).

Feeding a 2 or 3-day-old whitecoat

Feeding otters

What to feed adult otters

Otters are primarily piscivorous but they also eat meat. They can be given:

- fresh fish (or frozen fish with vitamin supplements to make up for vitamin loss during freezing): capelin, sprat, herring or mackerel (may vary according to the geographical location);
- minced meat;
- chicken hearts;
- for sea otters: minced clams, squid cut into thin strips (remove beak, gladius and ink sac), cod liver oil...

According to the animal's physical condition, gruel can be prepared with fish and meat:

- remove the heads and bones of fish (and skin for mackerel);
- blend the fish fillets to make a gruel;
- blend a chicken heart or minced meat;
- combine the two mixtures.

How to feed an adult otter

- Provide food in a dish placed in front of the animal.
- If the animal is unable to self-feed, it will require to be force fed.

Feeding bowl and an otter pup

The case of pups

If an oiled otter pup is brought to the rehabilitation centre:

- Feed it milk replacement formula for carnivores from a bottle (or syringe) every 2 to 3 hours (including throughout the night). Daily weight gain should be between 15 and 20%.
- Provide a daily food supply equal to 30% of the individual's body weight, divided between the different daily meals.
- Feed the pup when it is resting on its front and not its back.
- Inspect its spraint (stools) which should be semi-solid and yellowish scattered with whitish lumps.
- After each feed, stimulate micturition and defecation by massaging the perineum with a warmed cotton pad.
- To wean the pup, gradually add fish gruel and/or ground meat to the milk as well as possibly vitamins and minerals.
- Thereafter, thicken the gruel and reduce the quantity of milk until reaching the stage of feeding only pieces of fish and/or meat.

Feeding an otter pup

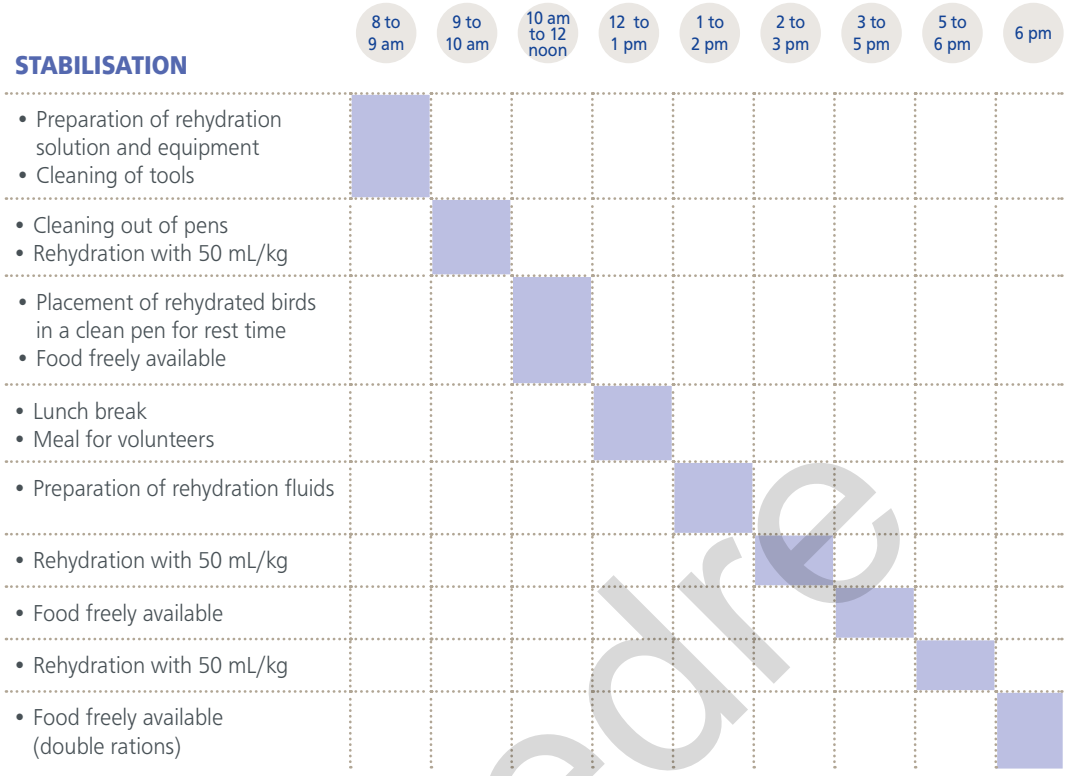
Daily routine for birds

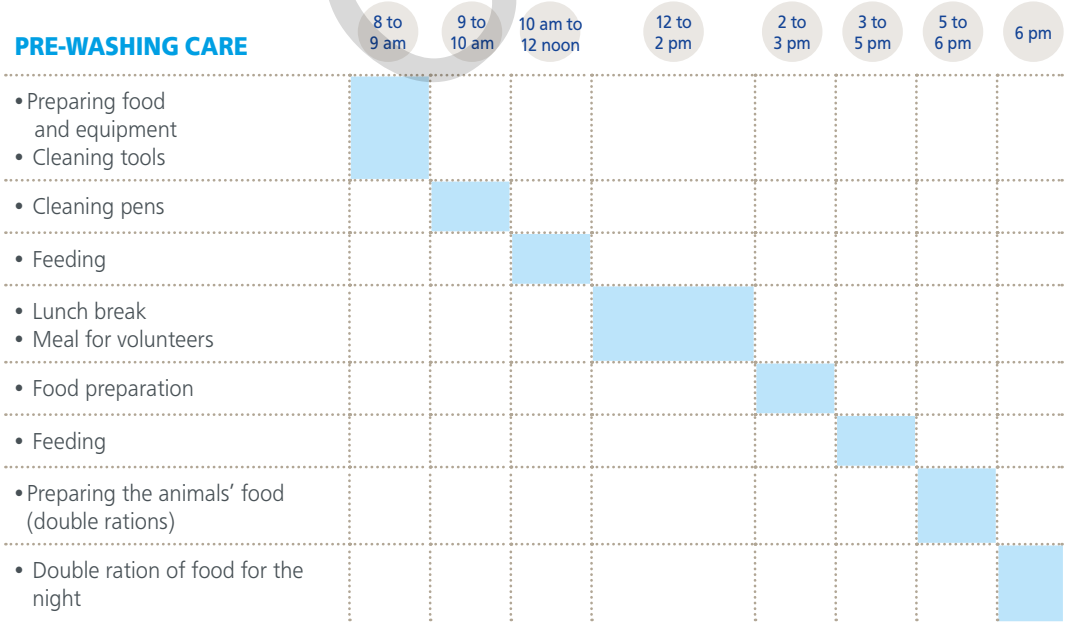
Birds should not be disturbed between each activity. Rest is an essential element of their rehabilitation. Even limited visual contact can generate significant stress. Any carcasses should therefore be removed during rehabilitation activities or at feeding times.

If veterinarians are present, blood samples, examination and weighing should take place during the same handling session. All possible measures should be taken to ensure the birds are disturbed as little as possible so as to optimise their chances of successful rehabilitation.

Food preparation: fish

Restraining and handling a gannet





Daily routine for birds - Stabilisation/Pre-wash care

Daily routine for pinnipeds

The animals should be given peace and quiet to rest between each activity, as rest is an essential element of their rehabilitation. If veterinarians are present, blood samples, examination and weighing should take place at the same time as animal handling. All possible measures should be taken to ensure the animals are disturbed as little as possible so as to optimise their chances of successful rehabilitation.

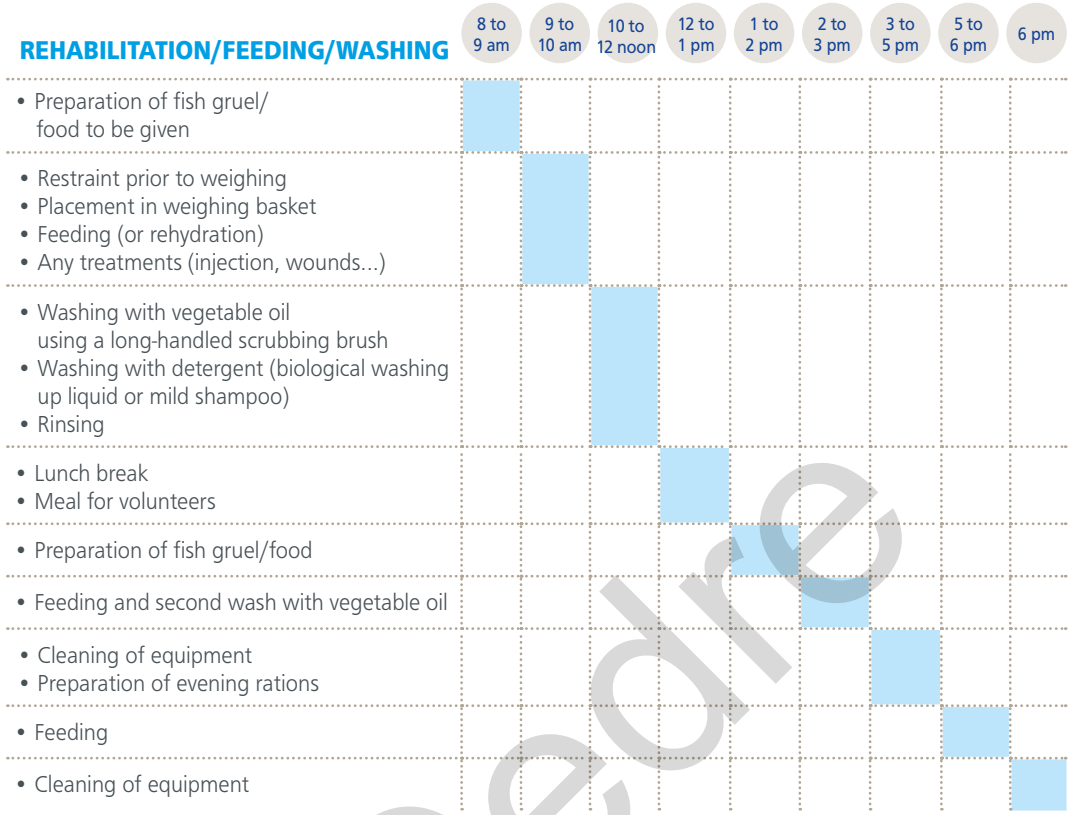
Heavily oiled pinnipeds may be washed up to twice a day. At the beginning of the rehabilitation process, it is recommended that they be fed up to three times a day. Once in rehabilitation pools, two meals are sufficient. Their daily nutritional requirements are estimated at around 4% of their body weight. This value should be adjusted on a case by case basis. Daily weighing enables close monitoring and will help to determine how much food to offer.

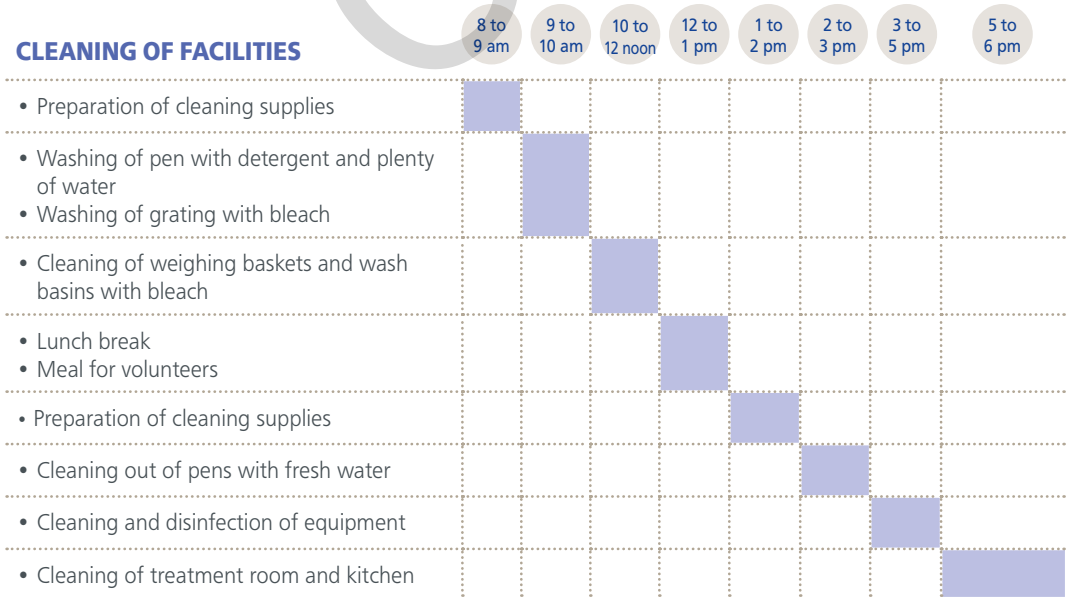
C25

Seal in a pen

Grey seal in a pen, with visible identification number

Seal in a pen





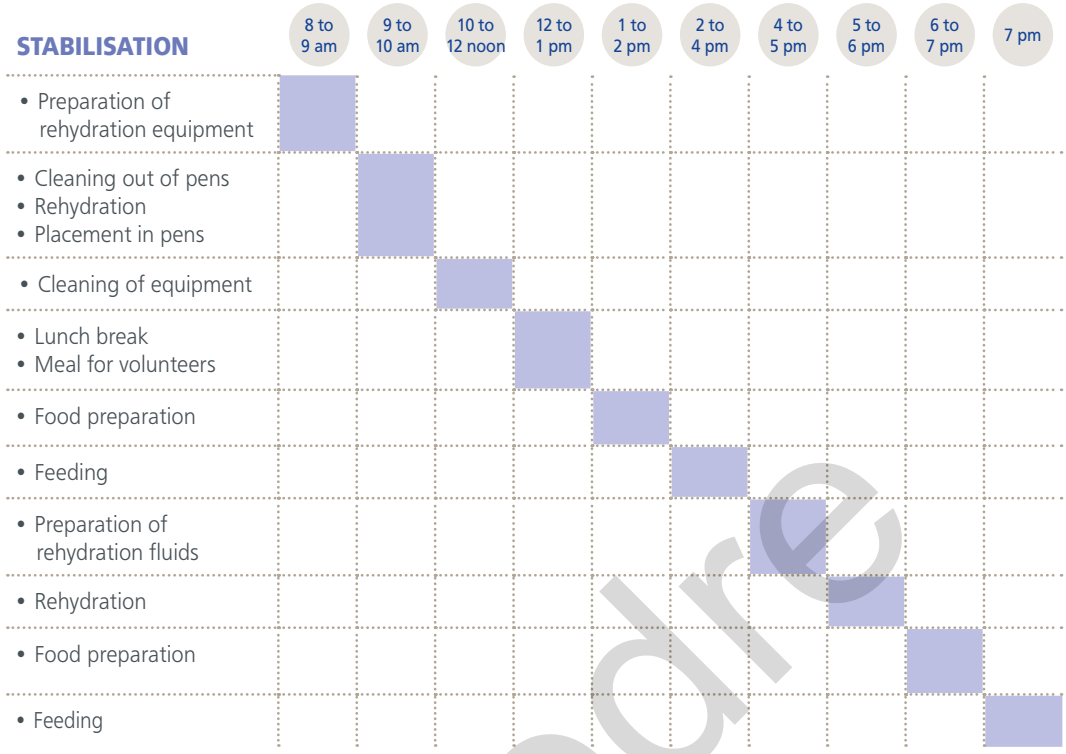
Daily routine for pinnipeds - Treatment/Feeding/Washing/Cleaning of facilities

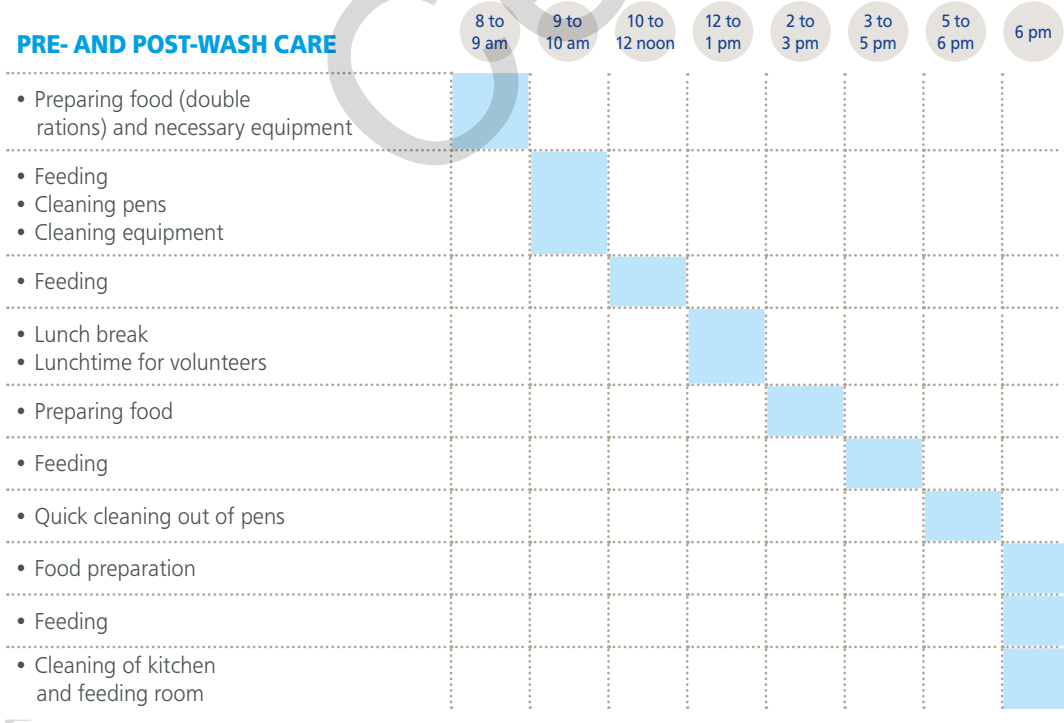
Daily routine for otters

The animals should be given peace and quiet to rest between each activity, as rest is an essential element of their rehabilitation. If veterinarians are present, blood samples, examination and weighing should take place at the same time as animal handling.

All possible measures should be taken to ensure the animals are disturbed as little as possible so as to optimise their chances of successful rehabilitation.

Feeding an otter





Daily routine for otters - Stabilisation/Pre- and post-wash care

Washing criteria for birds

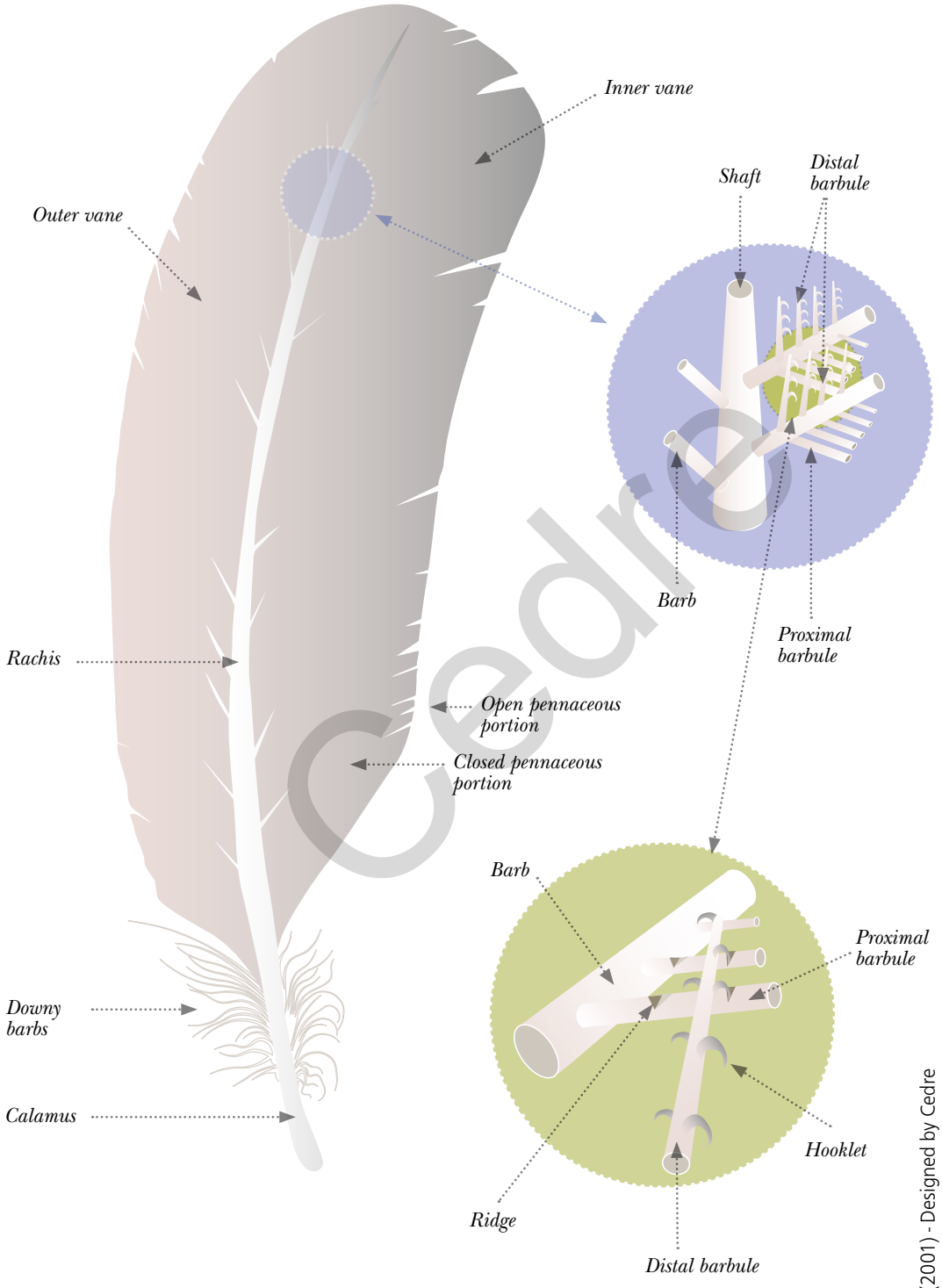
Washing allows birds to restore the waterproofing abilities of their plumage and recover their buoyancy on the water.

It is therefore important that these actions are carried out by professionals and that every step is carefully followed.

A bird is ready to be washed once:

- it is lively (bright eyed, head held upright) and sociable (interaction with other birds, contact calls ...);
- it reacts to stimuli (visual and auditory);
- it is able to self-feed;
- it is in good overall condition (no lesions or respiratory difficulties...);
- its body weight is within the normal range;
- its blood test results are satisfactory.

Rinsing



Structural diagram of a feather

Washing procedures for birds

Washing

The aim of washing is to completely eliminate all traces of oil from the feathers using detergent.

Equipment and personnel required:

- hot water supply (temperature between 40 and 50°C according to type of oil) with high flow rate;
- specific detergent;
- average washing time: 25 to 30 minutes;
- average rinsing time: 15 to 20 minutes;
- two to three people per workstation (according to size of birds): one in charge of washing, another restraining and possibly another in charge of logistics;
- suitably sized basins for the size of the birds.

C28

Cleaning a gannet's beak

Washing a gannet

Procedure:

- Prepare the equipment prior to the arrival of the bird (wash basins, hot water and detergent: as a rule of thumb 15 cl for 8 litres of water).
- Remove the bird from the box and place an elastic around its beak. Do not forget that certain species do not have external nostrils and could suffocate if the beak is completely closed: place a spacer between the two mandibles to hold the beak slightly open and attach with an elastic.
- Apply water-resistant gel to the eyes to protect against shampoo.
- First clean the nares, around the eyes and around the beak with a damp cotton bud.
- Place the bird in the water-filled basin, with its head out of the water.
- Clean the bird by spraying, soaking and flushing water over its feathers. Do not rub the feathers as this would damage their structure.
- Change basins if the water is oily (dark colour or lack of foam), or if the temperature drops below 40°C. Clean out the basins with solvent to remove all traces of oil.
- Pay particular attention to cleaning the axillary region, the back of the legs and membranes of the feet, the rump and the head.
- Change gloves if they are punctured or dirty.
- Examine the bird to determine whether it can be rinsed (experienced washer).

Rinsing

- Avoid all contact with the washing workstation. No traces of oil should be present on the staff's overalls, gloves, basins or sinks.
- Start rinsing in 1 or 2 basins of fresh water to remove the bulk of the detergent.
- Start rinsing at the head and work towards the tail, rinsing against the direction of the feathers.
- Hold the animal in a standing position. Be careful not to hold the head downwards.
- Constantly rinse the handlers' hands.
- Once rinsing is complete, the feathers should already begin to "fluff up" and the bird should appear almost dry. However its feathers are not yet waterproof.
- Determine whether the bird is clean and can be moved to the drying room (experienced rinser).
- Rehydrate the bird and move it to the drying room.

N.B. : provide a recovery and evacuation system of oily wastewater from washing and rinsing operations. Release into the wastewater system can be problematic given the presence of oil. If possible, provide water recovery tanks (see datasheet **C40** *).*

Drying

Drying should take place in a specific room, in pens with a floor grating. The density of birds per pen should be lower than for stabilisation, to prevent oiling of the feathers by droppings. For this reason too, the birds should not be fed during this phase.

The drying room should be well ventilated to prevent the development of micro-organisms. Drying is a two-stage process: a high temperature drying stage followed by a readjustment stage at room temperature.

- Apply an eye ointment or gel to prevent the cornea from drying out.
- Place the bird in a pen at an ambient temperature of around 20°C with sufficient, regular ventilation.
- If necessary use fan heaters to increase the drying temperature to around 25°C. The drying time will vary according to the type of bird: half a day for a guillemot and a whole day for a common eider for instance.
- Do not feed the birds until their plumage is completely dry.
- Implement a readjustment phase in pens at ambient temperature for a few hours to prevent cold shock response before they are moved to a pool. This phase is the chance to detect any signs of illness.
- During readjustment, feed birds by hand feeding or free feeding.

Rinsing

Drying in a pen

Washing criteria and procedures for pinnipeds

Criteria

Unlike birds and mustelids, pinnipeds do not preen or groom. The risk of ingestion during rehabilitation is therefore lower. It is thus not essential to remove all traces of oil during the first wash. What's more, oil does not affect their insulation capacity. Traces of oil are therefore removed incrementally over a number of washes. As stated previously, there is no real stabilisation phase; the animals can be washed as soon as they are admitted to a rehabilitation centre.

Washing and rinsing

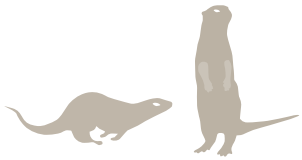
- Two or three people are required to restrain the animal during washing.
- Apply water-resistant gel (vitamin A-based) to the eyes to protect against shampoo.
- Prepare the supplies and equipment required for washing (any type of cooking oil), detergent (biological washing up liquid) or shampoo and a long-handled scrubbing brush.
- Prepare a crate for washing the animal.
- Capture the individual using the usual restraining method (see datasheet C9).
- Place the animal in the washing crate.
- Have one person control the animal's head.
- Coat the animal in vegetable oil.
- Scrub the animal with the long-handled scrubbing brush to loosen as much oil as possible.
- Coat the animal with shampoo or washing up liquid to remove the vegetable oil from its coat.
- Rinse abundantly with fresh water several times to remove traces of vegetable oil and detergent.
- Return the animal to its pen, following the usual restraining instructions during transport (see datasheet C9).

N.B. : unlike in the bird washing protocol, pinnipeds do not need to be dried. The regulation of their body temperature is not affected during washing.

Washing a seal

Rinsing a seal

Washing criteria and procedures for otters



Criteria

The rehabilitation of otters comprises a stabilisation phase prior to washing. Oil impairs otters' thermoregulatory capacity by preventing air from circulating effectively between hairs and can thus lead to hypothermia or hyperthermia according to weather conditions. The animal must therefore be warmed up or cooled down and appropriately hydrated before being sedated potentially for several hours.

Washing and rinsing

- Prepare the equipment required for restraint (thick leather gloves, lasso or net), sedation (syringe and sedative, plus darting equipment if necessary) and washing (vegetable oil, detergent).
- Sedate the animal: "dart" the animal from a distance with a tranquilizer gun or capture the animal using the usual restraint method (see datasheet C10). Sedation should be carried out by an experienced veterinarian.
- Take the animal to the washing room and lay it on a table.
- Have 3 to 4 people per washing table, one of whom will be specifically in charge of restraining the animal's head and front legs.
- Keep the animal sedated and monitor its body temperature.
- Use washing tables fitted with a tap providing a fresh water supply at a temperature of between 26 and 43°C (set the temperature according to the animal's condition and body temperature at the time of washing).
- Coat the animal in vegetable oil to dissolve the oil.
- Wash the animal by applying a repetitive wash - rinse - wash - rinse cycle.
- Use detergent diluted with water to a concentration of approximately 4% to remove the vegetable oil from the animal's fur.
- Rinse the animal's fur carefully. This stage can take up to an hour (after the end of washing).
- As a rule of thumb, allow 1 to 2 hours for the whole operation.

Drying

- Move the animal to the drying table.
- First, towel dry the animal.
- Then use a blow dryer blowing air at a controlled temperature.
- Dry the animal completely.
- Wake the animal (operation performed by a veterinarian).
- Place the animal in a large cage with a floor grating and with a sliding or hinged door on the top (or any other cage that is easy to handle) to facilitate access to the animal for treatment.
- Once the animal is fully awake from the anaesthetic and is in adequate condition (determined by veterinarian), transfer it to a small, cleaned, heated freshwater pool.

An otter after being dried

Recovery phase for birds

Pools

- Soft-sided above-ground pools or specially built pools (dug out, lined skips, etc.);
- Minimum surface area of 10 to 20 m² and a depth of 0.80 to 1 m;
- Rectangular pools rather than round;
- Light-coloured bottom;
- Closed-circuit water flow with filtration;
- Protective nets to prevent intrusion from other birds, escape, deposit of branches and leaves...;
- Install a slightly sloping (5%) ledge where birds can rest;
- Install intrared lamps, in the case of low temperatures, near the ledges rather than over the water;
- Cover the ledge with clear tarpaulin to facilitate cleaning and disinfection. The tarpaulin may be covered with synthetic carpet;
- Set up different pools according to rehabilitation stage (release pool, pool for newly rehabilitated birds, etc.);
- Possibility of installing a shower to encourage birds to preen;
- Regularly clean out the pools: pool vacuum for the bottom, removal of uneaten food (fish) with a scoop net, removal of droppings...

Recovery in pools

Water quality: an essential factor

Various measures must be taken to ensure that the water quality is sufficient for this purpose.

- Filtration system to recycle the water.
- Maintenance of a continuous flow of water.
- Installation of sand filters.
- Installation of ultraviolet filters (to prevent the proliferation of micro-organisms).
- Filtration rate 1 to 1.5 times the volume of the pool per hour.

Recovery

Feeding

The recovery period in pools gives birds the chance to restore behaviour close to that which they show in the natural environment. Birds can be fed live fish that they can catch by diving, which will rebuild their muscles. It is also possible to feed them dead fish supplemented with vitamin blends in basins or racks.

It is important to supervise feeding to ensure that all the birds have eaten sufficiently.

Organised supervision

A specific team composed of several people per pool should permanently monitor the pools. Drowning and distress are still risks even after the birds have been washed. Particular attention should be paid to the birds which have just left the drying room and their behaviour should be monitored. Birds should show behaviour as close as possible to their natural behaviour, i.e.:

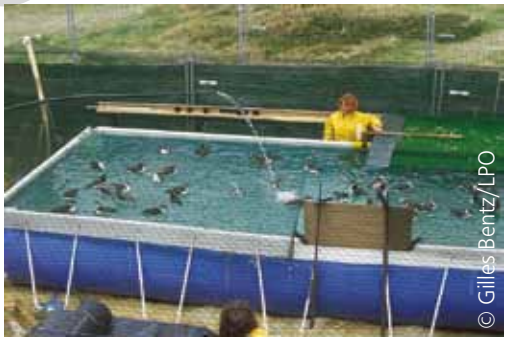
- preening (splashing water onto feathers + smoothing feathers);
- autonomously searching for food;
- interacting with other birds;
- rest phases on ledges at the beginning of the convalescence period then rest phases on the water at a later stage.

Being back on water has a positive effect on birds. Their convalescence is faster, they regain energy, put on weight, their blood tests show values close to normal.

Birds which do not independently go on the water will take longer to, or may never, restore their waterproofing. These birds are generally weak and may need to return to rehabilitation or their chances of successful release may need reconsidered.

It is crucial to recover a bird in distress on the water and to take it back to the drying facility. It is at risk of drowning if it is not given the necessary care. Several trips back and forth between the drying facility and the pool may sometimes be necessary.

When a bird uses the ledge to get out of the water and rest, it can be left unsupervised for longer periods of time.



Recovery in pools

Feeding in pools

Recovery in pools

Recovery phase for pinnipeds

Pinnipeds like to live in groups and there is no reason not to divide them into small groups during rehabilitation. It is nevertheless important to abide by a few rules to ensure adequate comfort.

Pools

- Use above-ground pools or specially built pools (dug out, lined skips, etc.).
- Set up a closed loop water circuit with filtration (sand filter with ozonator, carbon filter, UV sterilisation, low concentration of chlorine, salt concentration of approximately 33 to 35 g of salt per litre of water).
- Install protective nets to prevent intrusion from other animals and the deposit of branches and leaves.
- Set up resting areas if the pool is above ground.
- Install a concrete ledge around the pool if it is an in-ground pool.
- Set up different pools according to rehabilitation stage:
  - start with a ring around 10 to 12 m² (for 2 to 3 individuals)
  - once the seal has become used to the other seals and to swimming again, place it in a larger pool, around 35 m² (suitable for 8 to 10 individuals)
  - during the pre-release phase, use a pool around 50 m² (suitable for 10 to 12 individuals).
- Clean the pools on a daily basis (pool vacuum for the bottom, removal of uneaten food with a scoop net, removal of faeces...).

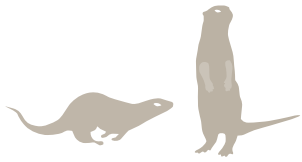
Recovery

- Divide the animals into groups by weight.
- Weigh them once a week to monitor their weight gain.
- Initially, feed them dead fish thrown immediately in front of each individual.
- Prior to release, feed them live fish to stimulate their hunting instinct.
- Feed twice a day. Calculate rations to reach a quantity of approximately 5% of each animal's body weight.
- When there are several animals in the same pool, make sure that they have all fed sufficiently.

Grey seal awaiting release

Grey seals in rehabilitation pool prior to release

Recovery phase for otters



The recovery phase for otters requires them to have access to an area with natural vegetation and a water source. Young otters may need to learn to swim and hunt.

Pools

After drying, place the otter in a freshwater pool heated to 18°C, without chlorine. The water flow should be high enough, with a water filtration system, to prevent faeces and food debris from soiling their pelt, which is not yet completely waterproof. Air gradually becomes trapped in their fur during grooming.

Watch out for signs of hypothermia due to insufficient grooming or traces of oil. The otter may also have difficulty in getting out of the water and on to the platform. In this case, it should be immediately removed from the water.

If no signs of hypothermia are detected after 5 days, the otter can be transferred to a larger pool. This pool can contain saltwater (especially for sea otters or otters living in coastal areas). It then takes 7 to 10 days for them to become fully waterproof again.

To ensure high water quality:

- sand filter with ozonator and rapid filtration system;
- pool pump;
- carbon filter;
- UV sterilisation;
- low chlorine concentration;
- water quality tests at least twice a week;
- chemical additive concentrations checked once a day.

Enclosures

Otters must have access to different types of substrates during the recovery phase. Ideally their enclosure should have natural vegetation and a seawater pool as well as a freshwater source.

- Close off the enclosure with a 2 m high fence with an overhang.
- Bury or cover the wire fence with concrete at least 50 cm deep.
- Provide a pool for swimming and learning to fish.
- Provide a large freshwater basin and regularly change the water.
- The otter must be able to self-feed on inert matter before being placed in an enclosure.

Adult recovery

- Feed the otter live prey so that it can learn to hunt again.
- As Eurasian otters are solitary, a female may be placed in an enclosure with a male under close supervision for the first few days.

The case of otter pups

An otter pup must be weaned and able to self-feed before being placed in an enclosure. Several pups can be placed in the same enclosure to boost their development. Learning to hunt is an essential step before being released into the natural environment. Once they have learnt this skill, they should only be fed live prey (trout and crustaceans). They should be supervised to ensure they are regularly catching prey.

Teaching an otter pup to swim

- Wait until it is around 12 weeks old before introducing it to the water.
- Place it in a shallow basin of water to let it get used the water and gain confidence, while supervising.
- Increase the size of the container over time.
- Ensure it has somewhere to rest, such as a makeshift ramp to get into and out of the pool.
- After bathing, towel dry the pup and place towels on the floor of its pen.

Rehabilitation in an enclosure with natural vegetation

Releasing birds

Releasing animals is an important milestone that rewards the entire team's hard work and dedication. Volunteers enjoy these moments, which are important for their morale and motivation. In order to ensure a successful return to life in the wild for birds, a number of criteria must be met.

Release criteria

1) Physical selection criteria, after observation:

- **impermeability:** dry plumage on which water should bead, for all parts of the body. The bird should be able to spend 36 hours in water without needing a break;
- **behaviour:** the animal should be in a good general state of health (bright eyed, head held upright, with diving and swimming behaviour), show social interaction with other birds (contact calls, preening, etc.) and react to exernal stimuli (visual and auditory);
- **health status:** the bird should not have any lesions, ailments or illness.

2) Physiological selection criteria, after examination:

- **body weight:** it should be within the normal range for its species and should be increasing;
- **bloods:** bloods tests can also be run to evaluate the bird's overall health status.

Choosing the site

The release site should be chosen in tandem with the relevant authorities (in France, ONCFS, DDPP and DREAL or their equivalent in overseas France), the permit holder of the rehabilitation centre and expert ornithologists. The site must meet certain criteria, such as:

- be completely free of pollution;
- be close to the rehabilitation centre (no more than a 4 to 5 hour journey);
- be shielded from wind and waves, at a distance from human activity, with no immediate risk for the bird (nets...), and harbour favourable conditions for birds (food supply, nesting grounds);
- offer easy access to rescue birds in distress;
- sufficient progress of clean-up at the initially affected sites. Animals are liable to return to these sites and be contaminated once again.

Preparing for release

1) Prior to release:

- obtain governmental authorisation to transport and release wildlife;
- choose the release site;
- order official metal rings (in France, from the French research centre on bird population biology, CRBPO).

2) The day before:

- prepare transport boxes or cages (one box per bird);
- check the weather and shipping forecasts (check with maritime authorities);
- run blood tests (optional).

On the day of release

- Do not feed birds that are going to be released.
- Ring the birds with metal rings. Warning: this task must be performed by a qualified bird ringer.
- Contact an official (from ONCFS, DDTM, DDPP or DREAL, in mainland France) to draw up an official report indicating the number of birds released, their ring number as well as the date and place of release. This official can also accompany the convoy to take part in the release.
- Put the animals in transport boxes. Be careful not to damage plumage while restraining the birds.
- Put the boxes in the transportation vehicle (make sure the vehicle is well-ventilated);
- Upon arrival, let the birds rest for around 30 minutes.
- Open the box with it facing the sea and gently tip it up to slide the bird out.
- Observe the birds (with binoculars or a telescope) until they have completely disappeared from view.
- Have a full-time observer spend the day after the release on site to collect and bring back beached birds.
- Write up a release report for the rehabilitation centre manager who will then sent it on to the plan coordinator and the authorities.

N.B.: It is recommended to release birds early in the morning to allow them the rest of the day to get their bearings, find food and preen themselves. A receding tide and fair weather would also provide optimal conditions. This would facilitate observation and the rescue of any birds in distress.

Releasing a great northern diver

Releasing common guillemots

Releasing pinnipeds

Release criteria

- The animal must be able to self-feed.
- It must have a body weight of at least 40 kg (for seals).

Preparing for release

- Obtain government authorisation to transport and release wildlife.
- Tag the animal: the tag is generally attached to the webbing of the hind right flipper for females and the left hind flipper for males. The tag features an identification number on one side and the contact details of the rehabilitation centre on the other.
- For medium term monitoring, the animal can be identified by dyeing its coat. This marking can last several months but will disappear when the animal sheds its coat.
- Seek a release site close to a colony and at an unoiled site.
- Choose a day when there is a spring tide, preferably at high tide.
- Run a blood test to check the animal's vitals.
- Conduct a final veterinary examination to validate the decision to release.
- For long term monitoring, consider electronically tagging the animal to conduct a behavioural study.

Pinniped identification tag

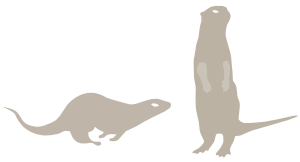
On the day of release

- Prepare the transport crate.
- Use the usual restraining method (see datasheet C9) to transfer the animal from the pool to the transport crate.
- Arrive at the site at high tide.
- Use the usual restraining method to transfer the animal from the transport crate to the beach, or tip the box onto its side if possible.
- Release the animal as close as possible to the sea so that it can reach the water as quickly as possible and leave shore with the tide.

Releasing grey seals

Releasing grey seals

Releasing otters



Release criteria

Otters can be released as soon as their vital signs (blood composition, body mass, fur impermeability) and their behaviour (independent swimming and hunting) are back to normal.

As soon as pups have developed hunting behaviour identical to that seen in the wild, they are ready to be released.

Avoid cold spells, droughts and flooding when planning releases. Wait for better weather conditions to increase the animals' chances of survival.

Choosing the site

The animal should be released as close as possible to where it was found. If this is impossible, release the animal into an area with no other otters in the immediately vicinity but in a region where the otter populations are genetically similar. The choice of location should be discussed with expert mammalogists and approved by the incident management centre (COD in France).

If the pups have lived together during rehabilitation, it is possible to release them in the same area.

Preparing for release

- Obtain government authorisation to transport and release wildlife.
- Run a blood test to check their vitals and to create a database for a potential post-spill study.
- Implant an identification microchip.
- Locate the release area.
- Seek the owner's permission if the land where the animal is to be released is private land or a waterway (will depend on the otter's lifestyle).

On the day of release

- Prepare the transport box (in the same way as for capture).
- Do not feed the animal.
- Use the usual restraining method to capture the animal (see datasheet C10).
- Avoid stressing the animal, all movements should be fast and precise.
- Upon arrival at the release site, let the animal leave the transport box on its own and find its bearings.
- Leave food for the animal in the area.
- If possible, return the following day to leave more food.

Post-release monitoring

If monitoring the animal is possible and planned:

- set up stealth cameras in the release area.
- place a tracker on the animal (abdominal area);
- use a dye that will colour its faeces;
- leave food for the first few days at the release site.

Preparation and release

Release

Release

Capturing, transporting and rehabilitating turtles

Capturing and restraining

From a boat:

- Use a fishing net (or scoop net if the turtle is not too large).
- Sweep the net under the body of the turtle and gently hoist it in.

On the shore:

- Take hold of the sides of its shell to lift it up.
- Use a carrier for transit.
- Never carry a turtle by its flippers.

Risks and precautions:

- risk of cuts, bites or flipper blows;
- viruses and parasites may be carried by the animals;
- wear gloves during handling and possibly waterproof clothing;
- wash hands and forearms thoroughly after contact with the animal.

Transportation

- Use a plastic or fibreglass box with rounded corners and slightly sloping walls.
- Line the bottom of the box with damp cloth.
- Transport the turtle ventral side down.
- Do not transport the turtle in water to avoid drowning.
- Cover the shell with damp towels taking care not to block its breathing.
- Consider coating the shell and skin with Vaseline or lanolin to avoid drying (especially young turtles). The optimal temperature for transporting turtles is between 20°C and 25°C. If it is 22°C or lower: wrap a dry towel around the animal. If the temperature exceeds 25°C: transport the sea turtle with a damp towel on its shell and dampen its head (except if there is air conditioning).

Examining a recovering loggerhead sea turtle at CESTM

From the clinical examination to stabilisation

Once the turtle has arrived at the rehabilitation centre, treatment should begin promptly.

When oil ingestion is suspected, care must be taken to mitigate its effects. Compounds containing charcoal (which blocks hydrocarbon absorption) or organic fats (mayonnaise), which help to clear oil from the oesophagus and the gastrointestinal tract, can be used. Gastrointestinal coating agents reduce irritation and gastrointestinal burns. It is also necessary to monitor the abundance of secretions coming from its salt glands.

Treating a recovering loggerhead sea turtle at CESTM (Centre for Sea Turtles)

Examining a recovering loggerhead sea turtle at CESTM

Rehydration

- Rehydrate by tube if possible given its conditions (1 ml of dextrose 50% per kg), 3 to 6 times a day.
- Dilute the solution with Ringer's solution, saline solution or gruel.
- To make it easier to introduce the tube, line the end of the tube up with the beak of the turtle, unwind it, measure and mark the point on the tube which corresponds to the second vertebral scute of the shell. You can then see how long the tube needs to be in order to reach the anterior portion of the stomach.
- Hold the turtle with its head vertically.
- Gently tap the turtle's nose so that it opens its beak. For small turtles, use a teaspoon to lever its mouth open. A mouth gag can be used to avoid cuts and bites.
- It is possible to lubricate the tube with, for example, vegetable or fish oil.
- Extend the turtle's neck to make it easier to introduce the tube.
- Insert the tube into the oesophagus.
- Do a preliminary test with dyed fresh water to see if the animal accepts the fluid.
- Next, administer the rehydration solution.
- Pinch the tube and remove it.
- Keep the turtle's head at a 45° angle for 3 to 5 minutes to prevent it from blocking its breathing or regurgitating.
- Place the turtle in water for a few minutes, to allow it to clear its throat and to expel excess solution. Liquid could come out of the turtle's nose. This is normal and does not mean the animal has breathed in solution. If the turtle begins to emit a foul odour, it is a sign that it has regurgitated or breathed in solution. If this is the case, immediately remove the tube and tilt the turtle's head downwards to clear its respiratory tract, then place the animal back in the water;
- If this method is unsuccessful, place an intravenous catheter.

Feeding, recovery and release of turtles

Feeding

- Offer a balanced, varied, healthy diet at the beginning of rehabilitation, then adjust the proportions according to the turtle's needs.
- Give a quantity of food equal to between 1 and 5% of the turtle's body weight (5% for cachectic turtles and 1% for a turtle with normal body weight).
- Feed the turtle 1 to 3 times a day, according to the physical condition and medication to be administered.
- Comply with sea turtles' main diet: fish, squid and leafy vegetables. Add vitamins and minerals.

The food may be fresh or frozen. Frozen food should be thawed in cold water and used within 24 hours.

Towards the end of the rehabilitation period, it is important to offer live food to encourage hunting behaviour close to that seen in the wild.

Feeding a loggerhead sea turtle

Washing

- Wash turtles with mild detergent or another mild surfactant and hot water. Cooking oils are also effective.
- Rinse and dry.
- Repeat washing 24 to 48 hours later according to the turtle's health condition.
- Clean the head and oral cavities with a damp cloth and cooking oil.

Recovery in pools

- Choose a pool that is easy to clean, repair and modulate.
- Use a covered/shaded pool with hiding places (to reduce stress).
- Use a filtration system (sand or cartridge filter) and a water cooling or heating system (do not exceed 28°C).
- Keep the salinity between 32 and 36 g/L, or possibly lower if the turtles have parasites (leeches or barnacles), if they are dehydrated or if they show excessive buoyancy (difficulties submerging, asymmetrical swimming, etc.).
- Adjust the salinity (reduce to around 20 g/L) for short periods of time to help eliminate bacteria.
- Check that the pH of the water is between 7.5 and 8.5.
- If chlorine is used to treat the water, make sure the concentration is between 0.5 and 1.0 ppm.
- Keep the turtles in water as much as possible: do not leave them out of water for more than 4 hours per week, unless advised otherwise by the veterinarian.
- Consider the turtle to have recovered when it makes coordinated movements with its flippers when swimming and when it holds its head at a 45° angle when it comes up to breathe.

Release

Like for all protected species, releasing turtles requires authorisation from the relevant authorities for the geographical area concerned.

It is preferable to release turtles in the area where they were originally found if the site has been cleaned up. The most common protocol is to place the animal on the shore and let it make its own way to the water's edge. If the species or stage of development at the time of release do not match that of turtles found on the shore, the turtle may be released from a boat close to a known site of occupation.

Monitoring

A metal tag can be placed on their flipper. Additionally, a PIT tag (Passive Integrated Transponder) can be injected under the skin, into a muscle.

It is also possible to place a coloured marking on the shell for short term monitoring, however the colour will fade over time.

Releasing a loggerhead sea turtle with a satellite tag after rehabilitation at CESTM

Managing dead animals

Carcass storage and disposal

Carcasses must be disposed of in accordance with the directives issued by the authorities, either by a renderer or by an incineration plant. For each species, carcasses must be counted, and animals which were dead upon arrival at the rehabilitation centre must be differentiated from those which died during the rehabilitation process. Carcasses must be stored in specific, closed, watertight containers to prevent all contact with living animals at the centre.

All carcasses found on beaches should also be counted and stored together in a plastic bag pending transport and disposal. It is worth considering keeping a few carcasses as evidence of the pollution. These carcasses should be wrapped in aluminium foil before being placed in plastic bags to prevent them from being contaminated. Ringed animals should be set aside for monitoring purposes. It is important to collect dead animals in order to prevent all risks of further contamination of scavenging animals.

Each bag should be marked with the following information:

- the number of carcasses;
- the species contained in the bag (if the animals can be identified);
- the place, date and time of collection;
- the finder's contact details.

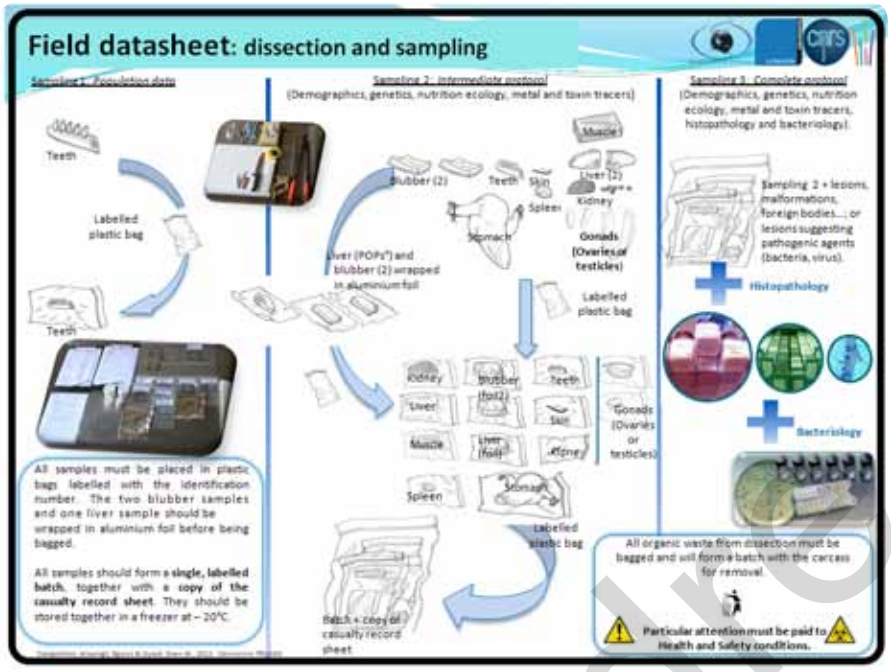
Necropsy

Necropsies can be performed on animals which died during rehabilitation to understand the exact cause of their death. This could be due to the effects of oil, the stress of being in captivity or a failure in the rehabilitation process. The results can be used for studies on the impact of oil on biological tissues as well as to improve oiled wildlife rehabilitation protocols. Certain suspicious cases may also undergo necropsies (suspicion of aspergillosis or excessive oil ingestion).

Use of biological equipment

The carcasses of oiled animals constitute a large tissue bank which can be used to study species that are usually difficult to observe and reach. They should be stored in a freezer set aside for this purpose. Certain types of tissues can be used for more in-depth study of the species and its genetics. This requires authorisation.

Collecting carcasses



Translated from French version © Willy Dabin / Observatoire PELAGIS

Field guidelines: dissection and sampling

© CVFSE

Necropsies on birds after winter storms 2013-2014

© DTAM975/ Thierry Hamel

Necropsy on a pinniped

© DTAM975/ Thierry Hamel

Taking samples for subsequent examination

Waste management

Packaging and removal

The issue of waste removal must be carefully considered. Potentially infectious healthcare waste must never be disposed of with household waste. A specific sorting process must be implemented. In France, this waste is generally disposed of in special yellow containers, bearing biohazard pictograms and the name of the producer.

This waste can be removed by a specialised waste removal contractor (the list of partners for mainland and overseas France is available on the ARS website) or by taking it to a specialised collection centre. Potentially infectious healthcare waste must be stored in a safe place protected against theft, deterioration and animal intrusion. This place must also be easy to clean and well ventilated.

Administrative aspects under French legislation

All documents produced relating to potentially infectious healthcare waste must be kept for 5 years and be able to be produced upon request by the relevant authorities (in France the regional health board ARS). The exchange of containers should come under an agreement signed by the waste producer (here the rehabilitation centre permit holder) and the collection contractor. Every time a container is removed or deposited, a tracking slip is produced when the container is handed over to the collection contractor. This tracking slip is returned to the rehabilitation centre by the destruction facility operator, indicating the final treatment conducted.

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Hazardous healthcare waste containers: bag, bins and box

Waste sorting

The different types of waste produced by the rehabilitation centre must be sorted and removed for recycling or elimination.

Below is a list of the main types of waste to be sorted:

Type of waste	Type of container	Disposal
• Pharmaceutical product packaging	• Specific bin (yellow bag)	• Specific waste stream for pharmaceutical products
• Glass bottles or containers (e.g. rehydration fluid bottles, euthanasia solution bottles, etc.)	• Specific bin	• Specific stream
• Contaminated sharp items	• Sharps container, fully sealed at the end of use	• Specific stream
• Contaminated non-sharp items (compresses, bandages, etc.)	• Specific bin (yellow bag)	• Specific stream
• Contaminated liquid waste	• Specific drums for potentially infectious healthcare waste and similar liquids	• Specific stream
• Oiled bedding, cardboard boxes, newspaper	• Skip	• Incineration plant (household waste or hazardous waste, according to the degree of contamination)
• Unoiled bedding, cardboard boxes, newspaper	• Skip	• Conventional waste stream, incineration plant
• Kitchen waste (fish remains...)	• Skip	• Renderer
• Glass bottles (catering for volunteers)	• Specific bin	• Container for glass for recycling
• "Conventional" household waste	• Skip	• Conventional household waste stream
• Oily wastewater	• Recovery tank or settling tank	• Specific treatment plant or wastewater treatment plant
• Wastewater without oil	• None	• Conventional waste drainage to wastewater treatment plant subject to agreement of plant manager
• PPE	• Skip	• Household waste or hazardous waste, according to the degree of contamination

Further information

Glossary and acronyms

ARS: *Agence Régionale de Santé* (French regional health agency)

Bulk carrier: Vessel designed to transport solid bulk cargoes.

Certifaune: Veterinarian who has received specific training on caring for certain animals.

CESTM: *Centre d'Etudes et de Soins pour les Tortues Marines* (French research and care center for sea turtles).

COD: *Centre Opérationnel Départemental* (incident management centre).

Collection and triage facility: Centre whose role is to centralise the collection of animals, to select them according to their condition and to channel them towards the most suitable rehabilitation centre.

CVFSE: *Centre Vétérinaire de la Faune Sauvage et des Ecosystèmes* (Veterinary centre for wildlife and ecosystems).

DASRI: *Déchets d'Activités de Soins à Risques Infectieux* (potentially infectious healthcare waste).

DDPP: *Direction Départementale de la Protection des Populations* (Departmental Directorate for the Protection of the Population).

DDTM: *Direction Départementale des Territoires et de la Mer* (Departmental Directorate for Territories and the Sea).

DREAL: *Direction Régionale de l'Environnement, de l'Aménagement et du Logement* (Regional Directorate for the Environment, Planning and Housing)

DTAM: *Direction des Territoires, de l'Alimentation et de la Mer de Saint-Pierre-et-Miquelon* (Saint Pierre and Miquelon Directorate for Territories, Food and the Sea).

Forward holding centre: Centre whose role is to centralise the collection of animals to channel them towards a rehabilitation centre where they will be given the necessary care.

Grounding: Accidental immobilisation of a vessel in a place where the water is too shallow to allow it to float.

IFAW: International Fund for Animal Welfare.

IFO: Intermediate Fuel Oil.

LPO: Ligue pour la Protection des Oiseaux (French bird protection organisation, a partner of BirdLife International).

MARPOL (MARine Pollution) Convention: International Convention for the Prevention of Pollution from Ships.

ONCFS: *Office national de la chasse et de la faune sauvage* (French National Hunting and Wildlife Agency)

Ore carrier: Vessel designed to transport heavy bulk cargo (e.g. iron ore).

ORSEC: *Organisation de la Réponse de Sécurité Civile* (French maritime emergency response system).

PCO: *Poste de Commandement Opérationnel* (incident command post).

PIT tag: Passive Integrative Transponder.

POLMAR: *POLlution MARitime* (maritime pollution).

Polyisobutylene: Saturated homopolymer showing low reactivity with gases and used in the manufacture of chewing gum and sealants.

PPE: Personal Protective Equipment.

Protected species: Species of animal with a special legal protection status due to its heritage value or scientific interest.

PVC: Polyvinyl chloride.

RSPCA: Royal Society for the Prevention of Cruelty to Animals.

SEPNB: *Société pour l'Étude et la Protection de la Nature en Bretagne* (French society for the study and protection of nature in Brittany, now Bretagne Vivante).

Bibliography

BARBIERI T. Black Tide in Bay of Plenty. Lamor Newsreel. 2012, n° 01, pp. 17-23. Available at: http://global.lamor.com/pdf-books/newsreel-1-2012/HTML/files/assets/downloads/publication.pdf (visited on 11.12.2017)

BENTZ G., GALANT O. Centre de soins LPO/UNCS Ile Grande. Bilan 2000 : centre de soins 7 îles. Rochefort: LPO, 2001, 15 p.

BLUVIAS J.E., ECKERT K. Marine Turtle Trauma Response Procedures: a Husbandry Manual. Ballwin: Wider Caribbean Sea Turtle Conservation Network (WIDECAST), 2010, 102 p. (Technical Report, No. 10). Available at: http://ufdc.ufl.edu/AA00011919/00001 (visited on 11.12.2017)

BRETAGNE VIVANTE-SEPNB, OBSERVATOIRE DES MAREES NOIRES, LPO. Marée noire de l'Erika : contribution à l'étude de l'impact sur l'avifaune. Bilan national des échouages et de la mortalité des oiseaux (BNEMO). [s.i.] : DIREN Bretagne, 2003. 96 p.

BRUCY L., DUGUE A-L., TELLIER M. Marée noire du Prestige : bilan des opérations de lutte à terre menées par la LPO dans le cadre des PSS POLMAR Terre du 13/11/02 au 30/04/03. Rochefort: LPO, 2003, 81 p.

CAPA-FRANCE. Informations, Aide & Soutien au Certificat de Capacité (non-domestique) et aux Autorisations d'Ouverture d'Etablissement. Available at: www.capa-france.com/ (visited on 11.12.2017)

CICOLELLA A. Evaluation des risques sanitaires et environnementaux résultant du naufrage de l'Erika et des opérations de nettoyage des côtes : dossier Erika. Rapport de synthèse. Verneuil-en-Halatte: INERIS, 2000, 33 p. Available at: www.iaea.org/inis/collection/NCLCollectionStore/_Public/37/077/37077270.pdf (visited on 11.12.2017)

DAUTELOUP C. Protocoles de démazoutage des oiseaux : étude dans quatre centres de sauvegarde de la faune sauvage. Thèse pour obtenir le grade de docteur vétérinaire. Toulouse: Université de Toulouse, 2010, 206 p. Available at: www.fedechasseurslandes.com/IMG/pdf/protocole_de_demazoutage.pdf (visited on 11.12.2017)

DIRECTION GENERALE DE LA SANTE. Déchets d'activité de soins à risques : comment les éliminer ? 3e édition. Paris: Ministère de la Santé et des Sports, 2009, 91 p. (Guide Technique). Available at: http://social-sante.gouv.fr/IMG/pdf/Guide_Dasri_BD.pdf (visited on 11.12.2017)

FERLAUX C. Traitement des oiseaux mazoutés de la marée noire de l'Erika au centre de soins de l'Ecole Nationale Vétérinaire de Nantes : Thèse pour le diplôme d'état de Docteur vétérinaire présentée et soutenue le 8 octobre 2001 devant la faculté de Médecine de Nantes. Nantes: ENVN, 2001, 301 p.

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION. Marine Turtle Conservation Guidelines. Revised 2007. Tallahassee: FFWCC, 2007, 110 p.

GARCIA R. The Prestige: one year on, a continuing disaster. Madrid: WWF- Spain, 2003, 25 p. Available at: wwf.fi/mediabank/1085.pdf (visited on 11.12.2017)

GARCIA L., VIADA C., MORENO-OPO R. et al. Impacto de la marea negra del Prestige sobre las aves marinas. Madrid: SEO/BirdLife, 2003, 126 p. Available at: www.seo.org/wp-content/uploads/2012/10/Informe_Prestige_SEO_BirdLife.pdf (visited on 11.12.2017)

HIVERT G. Eléments de gestion sanitaire d'une marée noire à l'usage des DDASS. Mémoire Ingénieur du Génie Sanitaire. Rennes: Ecole Nationale de la Santé Publique, 2000, 107 p.

IMO. MARPOL consolidated edition 2011: articles, protocols, annexes and unified interpretations of the international convention for the prevention of pollution from ships, 1973, as modified by the 1978 and 1997 protocols. Fifth edition. London: IMO, 2011, 447 p.

INTERNATIONAL BIRD RESCUE. 2000 - Treasure Spill - South Africa. Available at: http://blog.bird-rescue.org/index.php/2000/06/2000-treasure-spill-south-africa-2/ (visited on 11.12.2017)

IPIECA-IOGP. Wildlife response preparedness: good practice guidelines for incident management and emergency response personnel. London: IPIECA-IOGP, 2014, 58 p. (IOGP Report: 516). Available at: www.oiledwildlife.eu/sites/default/files/Wildlife_response_2017.pdf (visited on 11.12.2017)

ITOPF. Effects of oil pollution on the marine environment. London: ITOPF, 2011, 11 p. (Technical information paper, n°13). Available at: www.itopf.com/fileadmin/data/Documents/TIPS%20TAPS/TIP13EffectsofOilPollutiononthe MarineEnvironment.pdf (visited on 11.12.2017)

JACQUES H., CAPBER F., KUHN R., BARTHELEMY V. Prise en charge d'une loutre en détresse : conduite à tenir et soins vétérinaires. Plan National d'Actions en faveur de la Loutre d'Europe 2010-2015. Bourges: SFEPM, 2015, 34 p. Available at: www.sfepm.org/pdf/Prise_en_charge_loutre_detresse.pdf (visited on 11.12.2017)

LACROIX G. Evaluation initiale des risques lors des soins apportés aux oiseaux mazoutés : dossier Erika. Rapport 2. Verneuil-en-Halatte: INERIS, 2000, 27 p. Available at: www.ineris.fr/sites/ineris.fr/files/contribution/Documents/rapport2.pdf (visited on 11.012.2017)

LA LETTRE DE L'OBSERVATOIRE DES MAREES NOIRES, LPO, MINISTERE DE L'ENVIRONNEMENT. Soins aux oiseaux mazoutés : guide méthodologique d'aide à la création d'un centre de sauvegarde temporaire. Nantes: Observatoire des marées noires, 2002, N.p.

LE DREAN-QUENEC'HDU S., RISI E., L'HOSTIS M. Soins aux oiseaux mazoutés : mise à jour depuis le naufrage de l'Erika. Bulletin de l'Académie vétérinaire de France. 2005, 158 (3), pp. 295-301. Available at: http://documents.irevues.inist.fr/handle/2042/47780 (visited on 11.12.2017)

LEGIFRANCE. Code de l'environnement. Article R413-4. Available at: www.legifrance.gouv.fr/affichCodeArticle.do?cidTexte=LEGITEXT000006074220&idArticle=LEGIARTI000006837770&dateTexte=&categorieLien=cid (visited on 11.12.2017)

LEGIFRANCE. Code de l'environnement. Article R413-14. Available at: www.legifrance.gouv.fr/affichCodeArticle.do?cidTexte=LEGITEXT000006074220&idArticle=LEGIARTI000006837781&dateTexte=&categorieLien=cid (visited on 11.12.2017)

LEGIFRANCE. Code de l'environnement. Chapitre III : Etablissements détenant des animaux d'espèces non domestiques. Available at: www.legifrance.gouv.fr/affichCode.do?idArticle=LEGIARTI000006833729&idSectionTA=LEGISCTA000006159252&cidTexte=LEGITEXT000006074220 (visited on 11.12.2017)

LEGIFRANCE. Code de l'environnement. Section 1 A. Inventaire du patrimoine naturel. Article L411-1 A. Available at: www.legifrance.gouv.fr/affichCode.do?idArticle=LEGIARTI000033019166&idSectionTA=LEGISCTA000033019164&cidTexte=LEGITEXT000006074220&dateTexte=20171219 (visited on 11.12.2017)

LPO, BRUCY L., DUGUE A-L. Bilan du plan national de sauvetage des oiseaux mazoutés : marée noire de l'Erika 1999-2000. Rochefort: LPO, 2001, 105 p.

LOUGHEED L.W., EDGAR G.J., SNELL H.L. Biological impacts of the Jessica oil spill on the Galapagos environment : final report v.1.10. Puerto Ayora: Charles Darwin Foundation, 2002, 127 p. Available at: http://studyres.com/doc/13019604/biological-impacts-of-the-jessica-oil-spill-on-the-gal%C3%A1pagos (visited on 11.12.2017)

LOUGHLIN T. R. Marine mammals and the Exxon Valdez. Cambridge (United States): Academic Press, 1994, 395 p.

LPO. Bilan d'intervention : pollution maritime du Tricolor en Nord Pas de Calais, décembre 2002 - janvier 2003. Rochefort: LPO, 2003, 40 p.

MAILLY C. Guide à destination des autorités locales : que faire face à une pollution accidentelle des eaux ? Brest: Cedre, 2012, 76 p. (Guide opérationnel)

MARINE POLLUTION CONTROL UNIT. Milford Haven 15 February 1996: the Sea Empress Incident. Southampton: Coast Guard Agency, 1996, 129 p.

MINISTERE DE L'ENVIRONNEMENT, MINISTERE DE L'AGRICULTURE ET DE LA FORET. Arrêté du 11 septembre 1992 relatif aux règles générales de fonctionnement et aux caractéristiques des installations des établissements qui pratiquent des soins sur les animaux de la faune sauvage. Journal officiel de la République française, n°219 du 20 Septembre 1992. Available at: www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000000541669&categorieLien=id (visited on 11.12.2017)

MINISTERE DE LA TRANSITION ECOLOGIQUE ET SOLIDAIRE. Faune sauvage captive. Available at: www.ecologique-solidaire.gouv.fr/faune-sauvage-captive (visited on 11.12.2017)

MONNAT J-Y. Les oiseaux de mer face aux pollutions pétrolières : difficultés dans l'établissement des bilans. In: UBO. Rencontres scientifiques internationales : 20 ans après l'Amoco Cadiz, 15-17 octobre 1998, Brest. Brest: UBO, 2000, 522 p.

MONNAT J-Y., GUERMEUR Y., AIRAUD G. L'Amoco Cadiz et les oiseaux. Brest: SEPNB, 1979, 239 p.

MURDOCH, S. Independent Review of Maritime New Zealand's Response to the MV Rena Incident on 5 October 2011. Wellington: Maritime New Zealand, 2013, 118 p. Available at: www.maritimenz.govt.nz/public/environment/responding-to-spills/documents/Independent-Review-MNZ-response-to-Rena.pdf (visited on 11.12.2017)

NEWMAN S.H., GOLIGHTLY R.T., CRAIG H.R. et al. The Effects of petroleum exposure and rehabilitation on post-release survival, behavior, and blood health indices : a common Murre (Urial aalge) case study following the Stuyvesant petroleum spill. Final report. Davis: Oiled Wildlife Care Network, Wildlife Health Center, University of California Davis, 2004, 46 p. Available at: www.vetmed.ucdavis.edu/owcn/local-assets/pdfs/COMU_report.pdf (visited on 11.12.2017)

NOAA (National Office of Response and Restoration). How Do Oil Spills Affect Sea Turtles? Available at: http://response.restoration.noaa.gov/about/media/how-do-oil-spills-affect-sea-turtles.html (visited on 11.12.2017)

O'SULLIVAN A. J., JACQUES T.G. Impact reference system. Effects of oil in the marine environment: impact of hydrocarbons on fauna and flora. Brussels: European Commission, 1999, 81 p.

POSOW. Oiled Wildlife Response Manual. Vallette: REMPEC, 2013, 58 p. Available at: www.posow.org/documentation/manual/manual/wildlife_manual.pdf (visited on 11.12.2017)

POUPON E., LAVENANT M., ROUSSEAU C et al. ORSEC Départementale et zonale : disposition spécifique POLMAR/Terre. Guide Tome S.2. Paris: Ministère de l'Intérieur, Ministère de l'Ecologie, du Développement durable et de l'Energie, DGSCGC, 2015, 84 p. Available at: http://polmar.cetmef.developpement-durable.gouv.fr/polmar/uploads/Guide_Polmar_Orga_Generale_2015-06_v%20finale.pdf (visited on 11.12.2017)

PREFECTURE DU FINISTERE. ORSEC POLMAR-Terre du Finistère : approuvé par arrêté préfectoral n° 2014210-0004 du 29 juillet 2014. Quimper: Préfecture du Finistère, 2014, 212 p. Available at: www.charente-maritime.gouv.fr/content/download/12196/72125/file/POLMAR-Terre29_approuve_290714_-_Version_finale_cle2818b4.pdf (visited on 11.12.2017)

RITCHIE W., O'SULLIVAN M. The Environmental Impact of the Wreck of the Braer. Edinburgh: The Scottish Office, 1994, 207 p.

RSPB. PIB and other Hazardous and Noxious Substances (HNS): a serious hazard to the marine environment. RSPB Briefing. United Kingdom: RSPB, 2014, 8 p. Available at: www.rspb.org.uk/Images/PIB_and_seabirds_RSPB_Briefing_tcm9-344511.pdf (visited on 11.12.2017)

RUSSELL M., HOLCOMB J., BERKNER A. 30-Years of Oiled Wildlife Response Statistics. In: Bird rescue Research, IFAW. 7th International Effects of Oil on Wildlife Conference , 14-16 October 2003, Hamburg - Germany. 18 p. Available at: http://pszshhw.bird-rescue.org/pdfs/IBRRC_stats_paper.pdf (visited on 11.12.2017)

SEA ALARM FOUNDATION. The activities of the Sea Alarm Foundation in the aftermath of the Tricolor incident. Brussels: Sea Alarm Foundation, 2003, 27 p.

SEA OTTER RECOVERY TEAM. Recovery Strategy for the Sea Otter (Enhydra lutris) in Canada. Vancouver: Fisheries and Oceans Canada, 2007, 56 p. (Species at Risk Act Recovery Strategy Series). Available at: www.sararegistry.gc.ca/virtual_sara/files/plans/rs_sea_otter_1207_e.pdf (visited on 11.12.2017)

SEEC (Sea Empress Environmental Evaluation Committee). The Environmental Impact of the Sea empress Oil Spill: Final Report of the Sea Empress Environmental Evaluation Committee. London: The Stationery Office, 1998, 270 p.

SHIGENAKA G., MILTON S., LUTZ P. et al. Oil and Sea Turtles: Biology, Planning and Response. Reprinted July 2010. NOAA: Washington, 2003, 111 p. Available at: https://response.restoration.noaa.gov/sites/default/files/Oil_Sea_Turtles.pdf (visited on 11.12.2017)

SIEVWRIGHT K. Post-release survival and productivity of oiled little blue penguins (Eudyptula minor) rehabilitated after the 2011 C/V Rena oil spill. A thesis presented in partial fulfilment of the requirements for the degree of Master of Science in Conservation Biology at Massey University. Palmerston North: Science in Conservation Biology, Massey University, 2014, 153 p. Available at: http://mro.massey.ac.nz/handle/10179/6315 (visited on 11.12.2017)

SMITH J.R., LOMBARDI C., LENGEL K., et al. Otter (Lutrinae) Care Manual: 4th Revision October 2009. Silver Spring: Association of Zoos and Aquariums, 2009, 155 p. Available at: www.aza.org/assets/2332/otter_care_manual2.pdf (visited on 11.12.2017)

THE SCOTTISH OFFICE: ENVIRONMENT DEPARTMENT. The Ecological Steering Group on the Oil Spill in Shetland: an Interim Report on Survey and Monitoring (May 1993). Edinburgh: The Scottish Office, 1993, 45 p.

THIBODEAUX T., REED-SMITH J. Successful Hand-rearing and Rehabilitation of North American River Otter (Lontra canadensis): Hand-rearing and Release Techniques to Maximize Chance of Success. Section 2 - Otter Housing, Vocalizations, and Health Care. [s.i.]: IUCN/SSC Otter Specialist Group, 2011, 11p. Available at: www.otterspecialistgroup.org/Library/TaskForces/OCT/North_American_River_Otter_Rehabilitation_Section_2.pdf (visited on 11.12.2017)

TRIPOGNEY C. Impacts des marées noires sur la santé humaine. Thèse de Doctorat en Médecine, diplôme d'état, soutenue le 26 septembre 2003. Brest: Université de Brest Bretagne Occidentale, 2003, 118 p.

VAN CANNEYT O., DABIN ., DOREMUS G. et al. Guide des échouages de mammifères marins. Cahier technique de l'Observatoire PELAGIS sur le suivi de la mégafaune marine. La Rochelle: Université de La Rochelle et CNRS, 2015, 64 p. Available at: www.observatoire-pelagis.cnrs.fr/publications/ouvrages/Guide-des-echouages (visited on 11.12.2017)

WALSH M. Rehabilitation of Sea Turtles. In: ECKERT K.L., BJORNDAL K.A., ABREU-GROBOIS F.A. et al. Research and Management Techniques for the Conservation of Sea Turtles: Prepared by IUCN/SSC Marine Turtle Specialist Group. Washington: SSC/IUCN Marine Turtle Specialist Group, 1999, 12 p. Available at: https://mtsg.files.wordpress.com/2010/07/36-rehabilitation-of-sea-turtles.pdf (visited on 11.12.2017)

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE. Washington Oiled Sea Otter Response Handbook. Washington: Washington Department of Fish and Wildlife, 2009, 66 p. Available at: http://wdfw.wa.gov/publications/00302/ (visited on 11.12.2017)

YOXON G. Caring for wild otters. In: INTERNATIONAL OTTER SURVIVAL FUND. The Return of the Otter in Europe – Where and How? 2003, Isle of Skye. Broadford: IOSC, 2003, N.p.

Annex 1:
Volunteer registration form

REGISTRATION FORM

Availability: .....
.....
.....

- Registration n°: .....
- Home phone n°: .....
- Mobile phone n°: .....
- Email address: .....

Registration form

Rescue centre: .....

PERSONAL DETAILS:

☐ Mrs/Ms ☐ Mr Surname: ..... First name: .....

Date of birth: ..... / ..... / ..... Place of birth: .....

Country: ..... Full main address: .....

.....

Profession: ..... Area(s) of competence: .....

Means of travel: ..... / ...../.....

Member of an association: ..... / ...../.....

MEDICAL DETAILS:

Blood group: ☐ A+ ☐ A- ☐ B+ ☐ B- ☐ AB+ ☐ AB- ☐ O+ ☐ O-

Mandatory vaccinations: ☐ Diphtheria ☐ Poliomyelitis ☐ Tetanus

Optional vaccinations ☐ Hepatitis A ☐ Hepatitis B ☐ Rabies

- Allergies: ☐ None ☐ Yes ..... • Food allergies: ☐ None ☐ Yes .....
- Other particular health issues (disability, heart problems, immunodeficiency, current treatment(s), pregnancy): .....

.....

Doctor:

- Name: .....
- Address: .....
- Phone n°: .....

Emergency contact:

- Name: ..... • First name: .....
- Relationship: .....
- Full address .....

.....

- Home phone n°: .....
- Mobile phone n°: .....
- Work phone n°: .....

IMAGE RIGHTS:

As a volunteer, I am liable to be photographed or filmed for non-commercial, educational or response monitoring purposes. I hereby authorise the use of my image: YES ☐ NO ☐

I hereby agree not to share any images or videos taken during my activities at the rehabilitation centre and not to disclose any information on my own initiative of the operations conducted at the rehabilitation centre.

Volunteer registered by:

- Name: .....
- Department: .....
- Date and place: .....
- Signature:

The volunteer:

- Name: .....
- Date and place: .....
- Signature:

Annex 2: Animal record sheet

ANIMAL MEDICAL RECORD SHEET

- Name of incident: .....
- Date of incident: ..... / ..... / .....
- Rehabilitation centre: .....
- Identification n° issued: .....
- Ring/tag n° (if already ringed/tagged): .....
- Ring/tag n° or marking system (at release): .....

SPECIES:

- Date of collection: ..... / ..... / .....
- Time of collection: .....
- Place of collection: .....
- Finder's contact details: .....
- Date and time of arrival at RC: .....

FIRST EXAMINATION:

Sex:	Age:	Plumage/coat:
☐ M	☐ Juvenile	☐ Summer
☐ F	☐ Immature	☐ Winter
☐ Undetermined	☐ Adult	☐ Moulting

Veterinarian's initials: .....

- Temperature: ..... °C
- Weight: ..... g
- Body condition: ☐ Cachectic ☐ Thin ☐ Normal ☐ Plump

- Degree of oiling:
  - ☐ Severe
  - ☐ Moderate
  - ☐ Low

- Extent of dehydration:
  - ☐ Not dehydrated
  - ☐ Slightly dehydrated
  - ☐ Moderately dehydrated
  - ☐ Severely dehydrated

- Other injuries: ☐ Head ☐ Wings ☐ Body ☐ Legs ☐ Flippers ☐ Respiratory tract
- Observations: .....

WASHING:

- Date: .....
- Start time: .....
- End time: .....
- Washer: .....
- Observations: .....

.....

.....

OUTCOME:

- Date: .....
- Result: ☐ Released ☐ Died ☐ Euthanised
- Transferred to: .....
- Behaviour during release:
  - ☐ Able to swim/fly < 100 m
  - ☐ Able to fly 100 to 1,000 m
  - ☐ Flew out of view
- Observations: .....

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Cedre in short

For nearly 40 years, Cedre has been delivering internationally recognised expertise in the field of accidental water pollution. Our fifty-strong team of scientists, engineers and technicians operates across the globe from our base located in Brest, France.
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